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THE ELEVENTH YEARBOOK

OF THE

NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

PART I

INDUSTRIAL EDUCATION: TYPICAL EXPERIMENTS DESCRIBED AND INTERPRETED

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS

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THE ELEVENTH YEARBOOK

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INDUSTRIAL EDUCATION: TYPICAL EXPERIMENTS DESCRIBED AND INTERPRETED

BY

F. M. LEAVITT, G. A. MIRICK, M. W. MURRAY,
J. F. BARKER, H. B. WILSON, C. F. PERRY, A. L. SAFFORD, P. JOHNSTON
M. BLOOMFIELD, B. W. JOHNSON

Edited by S. CHESTER PARKER, *Secretary*

THIS YEARBOOK WILL BE DISCUSSED AT THE ST. LOUIS MEETING OF THE NATIONAL SOCIETY, MONDAY, FEBRUARY 26, 1912, 8:00 P.M.

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PREFACE

At the Mobile meeting of the National Society for the Study of Education, it was decided that one of the 1912 Yearbooks of the Society should be devoted to a discussion of the actual progress that is being made in organizing schools for industrial education, and to an interpretation of the various lines of experimentation which are being undertaken.

In recent years there have been many notable discussions of the social and theoretical justification for industrial education. Perhaps the best known of these discussions, because of its wide circulation, as well as its thoroughness, is the report of the Committee on the Place of Industries in Public Education, made to the National Education Association in 1910. In spite of this widespread general discussion, however, there are many educators (who are not specialists in industrial education) who are not aware of what is actually being done to solve the problems which have been so thoroughly analyzed in print. Even among the leaders in industrial education, some of those in New England are not informed concerning the work being done in the Mississippi Valley, and vice versa; and many are totally ignorant of what is being done on the Pacific Coast. Some of the contributors to this *Yearbook*, who are firm believers in the special plans which they describe and have been successfully engaged in organizing, have expressed their surprise at their failure to locate other examples of the same type of undertaking. Further evidence of this overplus of theorizing, coupled with a dearth of concrete evidence, is found in some of the books on industrial education which exhibit considerable ignorance of real experiments while they elaborate at length on purely paper schemes for industrial education.

To carry out the plan adopted at Mobile, the Secretary secured the assistance of Professor F. M. Leavitt, of the department of Fine and Industrial Arts of the University of Chicago. Professor Leavitt kindly classified the experiments which are being tried, as shown in the Table of Contents, suggested as many examples as he knew, and assisted in securing contributors. Each contributor was requested, first, to describe in some detail the history, organization, and results of the particular school with which he is connected as the best example of the type; second, to compare it with other schools of the same type; and

third, to show how his particular type of undertaking contributes to a solution of the problem of industrial education. The various contributors have carried out these suggestions with different degrees of emphasis; some have described their own undertaking primarily, others have described and compared other examples at length, while some have emphasized primarily the element of interpretation. In all cases, however, the contributions carry out the plan of demonstrating practical possibilities instead of merely advancing theoretical suggestions.

I. CLASSIFICATION OF PLANS FOR INDUSTRIAL TRAINING

FRANK MITCHELL LEAVITT
Associate Professor of Industrial Education, The University of Chicago

When one attempts to interpret the significance of the numerous industrial or other so-called vocational schools which have been organized in the past decade, he encounters the difficulty of clearly differentiating the several examples studied. The names of the various schools do not serve to classify them as do the terms "Elementary School," "High School," "College," "University," or even "Commercial School," "Agricultural College," "Engineering School," and the like.

We find these schools variously named; for example, Elementary Industrial School, Elementary Technical School, Semi-Industrial School, Independent Industrial School, Trade School, Pre-Apprentice School, Vocational School, Special Industrial School, Technical High School, etc.

An examination of the courses of study and plans of organization of these schools shows that they merge and overlap in a way which defies absolute certainty in classification. Classification, however, there must be, and a brief description or defense of the one employed in this volume is here given.

In attempting to differentiate these schools, one comes to realize that most of them are dominated or controlled by a very definite purpose. Perhaps nothing serves better to distinguish all of these schools from our traditional educational institutions than the singleness of purpose with which they are administered, and the classification here made is based on the fundamental purposes of the different types of schools studied.

One further generalization may be made, namely, that in attempting to meet the very definite demand for training which is motivated by vocational purpose, two rather distinct types of endeavor are to be observed, one within the present school system and the other in a measure outside of, if parallel to, the existing schools. Generally speaking, the prevocational schools, and vocational high schools fall under the first classification, while the separate industrial schools and the trade schools come under the second.

PREVOCATIONAL INDUSTRIAL TRAINING IN THE SEVENTH AND EIGHTH GRADES

The purpose of prevocational work seems to be to secure the revision of the course of study in the upper elementary grades, both as to content and method, in order that the work given therein may appeal to those children whose vocational interests are drawing them away from the school altogether, and at a time when their education is extremely limited and fragmentary.

The schools employ the vocational motive as a strong incentive to hold the children in school, and secondarily as a vitalizing principle in determining the subject-matter of the course of study. These courses of study are not intended to deprive boys and girls of further education in the higher schools, but, on the contrary, they are intended to prolong the school life of the pupils and possibly to furnish another approach to the high school.

In order fully to understand the schools of this type, it is necessary for one to appreciate this double purpose of prevocational work. The word "vocational" serves in one case to describe the end of the education given, and in the other to indicate the interest which is utilized as an impelling force. These schools have invariably been an integral part of the school system, articulating with it in the most natural way, and they have eliminated nothing of the general culture which is commonly included in the work of the upper elementary grades.

INTERMEDIATE, INDEPENDENT, OR SEPARATE INDUSTRIAL SCHOOLS

While these schools have much in common with the prevocational schools, there is one radical difference. They do not commonly prepare their pupils for high schools. They are intended particularly for boys and girls who, having arrived at the age of fourteen, find themselves out of harmony with schools and school purposes, as they see them, and who would, failing this opportunity, probably enter immediately into industrial life. They are to a degree separate from both elementary and secondary schools, and independent of their domination. While these schools occasionally offer four years of work, few children entering them desire more than a short-term trade course. The work of the school, therefore, is made to appeal directly and immediately to the vocational interests of the children, and this interest is made the central and pre-

dominant factor in the school. Cultural work is given, but the proportion of time devoted to it is generally less than in prevocational schools. No scholastic requirements for admission are made in most instances, the age of fourteen years constituting the only necessary qualification. Schools of this type have been most needed where traditional education has been strongly intrenched and is unyielding to the needs of the future industrial workers. In some instances, where the economic needs of the pupils have been great, the bookwork has been reduced to a minimum, and the preparation for immediate industrial efficiency has been made the first consideration. Generally, however, every possible effort is made to include something of an inspirational and refining nature in the course of study.

THE VOCATIONAL HIGH SCHOOL

The vocational high school retains many if not most of the features of the traditional high school. It admits pupils only after the completion of the work of the eight elementary grades, and seeks to advance them along general educational lines, giving, however, the maximum amount of training in vocational subjects possible without jeopardizing the pupil's opportunity for advanced training in higher institutions of learning.

The vocational high school differs from the traditional high school in its attitude toward the pupil who cannot take the complete course but who desires to specialize in one of the practical arts and to prepare for early entry into vocational life. The work is therefore carefully adapted to those who can spend but two years in the high school. Four-year courses are offered, however, and very commonly followed by the pupils. In the last year intensive work in the technique of one trade or vocation is often permitted.

Thus the important characteristics of these schools are: early attention to vocational subjects, opportunity for immediate differentiation, for specialization, and, when elected, for considerable practice in trade technique. More attention to the related science and art of the trade or vocation is given in the vocational high school than in the prevocational work of the grades or in the separate industrial school, and, quite naturally, greater stress is laid on the value of the so-called cultural studies.

THE TRADE SCHOOL

Neither the prevocational school, the separate industrial school, nor the vocational high school claims to *teach a trade.* The trade school, generally speaking, does not claim to teach anything else. It is a "finishing" school and the pupil enters it only when he has determined what occupation he desires to follow. What the law school is to the lawyer, or the normal school is to the teacher, the trade school is to the young man or woman who has definitely determined to fit himself or herself for some chosen industrial position.

Usually the only requirement for admission is an age requirement, generally sixteen years of age or over, and it is not uncommon to find among the pupils in the trade school great variety in previous schooling. In the trade school may be seen high-school graduates, elementary-school graduates, and those who have not passed the fifth elementary grade.

The purpose of these schools is always clearly defined. They are intended to be thoroughly "practical" and to concentrate on the development of special skill and speed in the technique of a specific trade, and to give considerable actual experience in shop processes and shop methods of production.

The trade school is not articulated in any important way with the school system, for, while it may receive pupils from prevocational or separate industrial schools, the preparation given in these schools is not demanded for admission, and the school does not fit its pupils for some higher institution, but seeks to prepare them for a particular place in the industrial world.

THE PART-TIME CO-OPERATIVE PLAN

The part-time co-operative plan recognizes the fact that one may be educated *by* his work as well as *for* his work; it further recognizes that the desirable combination of work and study which was formerly possible for large numbers of children and youths is today well-nigh impossible without a carefully planned scheme of co-operation between the employers and the schools. The plan further recognizes that there is nothing more unfortunate in our social order than the necessity which confronts so many children of choosing between *all school* and *all work* at an early age.

The plan contemplates an arrangement of school program and shop employment whereby the pupil gains practical shop experience by working for an employer, and systematic instruction in the science and art of the industry in the courses offered in the school. The pupils work in the school and in the shop during alternate and equal periods, usually weekly, and receive wages from their employers while in the shop.

While the plan is capable of wide application, it should be noted that it cannot take the place of, or in any way render unnecessary, the other types of vocational schools included in this study, since the opportunities offered by it are limited to the number of co-operating employers and shop positions which the school authorities can secure. In some instances only a small percentage of the pupils who apply for such opportunities can be received. It is obvious that the public school must be more inclusive in its program.

THE CONTINUATION SCHOOL

The continuation school also depends upon co-operation between the employer and the school. A minimum amount of time, however, is devoted to the school work, generally from four to eight hours a week.

The co-operative schools organized on the half-time basis are planned for those who are still in the school system but who are feeling the pressure of economic conditions, or the urge of real life. The continuation school, on the other hand, is planned for those outside of the system, and already engaged in gainful occupations.

Pupils who have severed their connection with the schools without completing even the work of the elementary grades are induced to spend from four to eight hours a week in school, either continuing the regular grade work, or studying some phase of the vocational work in which they are engaged. The first schools of this type in the United States were held in the evening, but recently school authorities have endeavored to secure the co-operation of employers, and to provide for such instruction within the limits of the working day. In two states laws have been enacted which, under certain conditions, require the employers to permit children in their employ, who are between the ages of fourteen and sixteen years, to attend such schools without loss of pay.

These schools are more inclusive than the half-time co-operative schools, since provision can readily be made for all who desire or may be required to take the instruction provided.

VOCATIONAL GUIDANCE

Vocational guidance is a necessary corollary of vocational education, and the ultimate success of either one will depend upon the ability of the school system to furnish some measure of the other.

When the ideal of the school was to furnish an identical education for all children there was no need for guidance within the school, and there was little or no information within the school organization to insure the giving of intelligent advice regarding the major portion of the vocational field. Such advice as was given was generally confined to those who were fitting for professional life.

But with the widening of the educational horizon, and the broadening of the school's sympathy and interest, and especially with the wide opportunity for differentiation of purpose and method to be found in the schools, the absolute need for intelligent direction within the school, and for wise council and immediate assistance on entering upon vocational work, becomes apparent.

Vocational guidance, therefore, may concern itself with the choice of schools and curricula within the school system, with the minimizing of the difficulties and dangers attending the transition from school to work, or with the council and advice so frequently needed after the young worker has actually entered upon his work to keep him steadfast in his efforts and to induce him to continue, wherever necessary, some line of related study or practice.

II. PREVOCATIONAL INDUSTRIAL TRAINING IN THE SEVENTH AND EIGHTH GRADES

GEORGE A. MIRICK
Acting Superintendent of Schools, Indianapolis, Ind.

1. Introduction
2. Indianapolis
3. Boston: North Bennett St. Industrial School
4. Cleveland
5. St. Paul
6. Newark
7. Lists of Activities
8. Points of Agreement and Difference, Cost
9. General Principles
10. Conclusion

INTRODUCTION

The general content and method of this report was determined by the Secretary of the National Society for the Study of Education. He specified that it should be an "account of what has actually been accomplished" in prevocational industrial training in the seventh and eighth grades—that this accomplishment should be shown (*a*) by "a history descriptive of the organization, work, and results" in Indianapolis; (*b*) "by comparing the work of the Indianapolis schools with that of Boston (North Bennett Street Industrial School), Cleveland, St. Paul, and Newark, N.J."; (*c*) "by an interpretation of the type in terms of a statement of the way in which it meets the needs of the educational situation."

INDIANAPOLIS

A more extended report than can be made here may be found in the *Proceedings of the Western Drawing and Manual Training Association*, May, 1911.

Briefly, this program was started by Dr. C. N. Kendall, then superintendent of schools, in the department of one school. (In Indianapolis all seventh and eighth grades are organized on the department plan.) This program was started as an experiment to determine if the educational needs of a body of seventh- and eighth-grade boys and girls, made up largely of the non-book-minded, could be more fully met by a course of school work consisting of activities fundamental in the industries for one-third to one-half of the school time and of book-study for the balance of the time. The activities and the book were to be so related that the

one should support and vitalize the other, but in a way to retain all the values that we have been accustomed to believe inhere in the inherited book curriculum.

Character.—This "semi-industrial" course of study is, and is not, "vocational."

It is not vocational, in that no effort is made to have the pupils choose a specific line of work with the purpose in view of going into that as a business after they leave school. All the boys follow the same course of industrial work and all the girls the same course of industrial work. Boys and girls recite in separate classes except in the subjects that do not relate to the "activities." The purpose is to make the industrial work broad in its scope, but to carry each activity far enough to give an opportunity for the acquisition of sufficient skill to give satisfaction to the worker. On completing this course the pupils have the same opportunity that the graduates of other grammar schools have of entering either of the two high schools.

This course, while not vocational in the sense that it involves an early choice of a life-work, is vocational in at least three senses:

1. It is vocational in the sense that the methods of work followed in the various industrial activities are those followed in up-to-date industrial concerns, and the tools used are those used today in these industries. The mechanical habits and the industrial points of view would, it is assumed, "carry over" into similar occupations outside the school.

2. It is vocational in the sense that the commercial standard of quality in the product is made the school standard of quality. This standard, however, is kept in a subordinate place, as the product in school is an educational means, not a money-making end.

3. The semi-industrial course is vocational in the sense that through it the pupils gain a first-hand knowledge of the elements of various occupations and learn something of the possibilities and of the outcome of these occupations. They should become more intelligent in their final choice of an occupation. A part of the time devoted to industrial work is given up to repair work and to making things used in the schools. Several hundred dollars a year are saved to the school funds in this way. A part of the time is given to making things for personal use or for sale. The making of these things is not an "extra" but is made a part of each line of work.

Motives.—The new plan of study not only involved industrial activities to meet the tastes and aptitudes and possible later economic needs of pupils, but it involved also a more varied appeal to interests and furnished a greater variety of motives. Any interest or motive that will keep a boy or girl hard at work is considered legitimate.

Teachers.—The teacher is a most important factor in the semi-industrial school problem. The school training of a majority of teachers unfits them to deal with a course of work based on practical application and with an educational process in which the pupil's point of view, tastes, aptitudes, and capacities are to take precedence over her own. The shopmen, the sewing-teachers, and the cooking-teachers have all had some work in the "trades," but not as much as is desirable. The academic teachers are all conscious of the need of relating the book to the activity, and some progress is being made. Some teachers have confessed an inability to adapt themselves to the new program and they have been replaced by others. On the other hand, this new work has appealed strongly to some teachers. It has opened up a new field of usefulness to them, and they have been glad to take summer courses in order more adequately to fit themselves to take up this work.

Inasmuch as the central idea of this semi-industrial program is that the "activities" are an inherent part of the course and not an "extra," it follows that the teachers in charge of the "activities" and the teachers in charge of the books shall form one body. It also follows that not as many book teachers are needed. This year one "book" teacher has been dispensed with in each department by giving to one teacher, specially trained in each subject, the sewing and girls' artwork. This teacher is also competent to teach one or more other subjects. It would be an ideal arrangement to have the teacher of English also teach the printing. However, no English teacher has had practical printing experience.

Pupils.—Almost exclusively, the pupils are of the seventh and eighth grades. The course is not optional in the schools in which it has been placed. No pupils have asked for transfer to buildings where the "book" courses prevail. One school is so situated that it can receive pupils from other buildings. From five to fifteen such boys are received each term. So far the girls have preferred to stay at the home school.

A few overaged boys from the sixth grade have been advanced to the seventh-grade semi-industrial work. They are able to maintain their advanced standing.

Curriculum.—

SEMI-INDUSTRIAL SCHOOLS

(*Departmental*)

Seventh and Eighth Years

The following general program is supplemented by a more definite statement regarding the different subjects.

Subject	Number of Exercises per Week	Minutes per Week
I. THEORY		
English	..	240
1. Composition (dictation)	..	..
2. Reading	..	..
3. Spelling	..	..
Word-study	..	..
4. Grammar	?	..
Mathematics	4	120
Geography, history, civics	3	90
Hygiene	1	30
Penmanship	?	..
Music	..	60
		540
II. PRACTICE		
(A) Boys	..	490
1. Shop	..	..
(*a*) Benchwork; (*b*) mechanical drawing and designing (90 minutes)	..	..
2. Printing	..	..
3. Iron-work	..	..
(B) Girls	..	490
1. Home economics	..	..
(*a*) Cooking; (*b*) housekeeping; (*c*) sewing; (*d*) cleaning and dyeing of textiles; (*e*) weaving; (*f*) mechanical drawing and designing (90 minutes)	..	..
III. STUDY, ETC.		
Study	10	300
Opening exercises	5	50
Physical exercises	3	45
Recesses	5	75
		465
Total minutes in week		1,500

Notes on the Theory Part of the Semi-Industrial Program

ENGLISH

1. The time allotted to English may be divided so as to meet local needs.

2. Some reading should be done in connection with the industrial work, during the reading periods, in "Shop" and "Home Economic" time, and at home. Books should be read and discussed which throw light on the general industrial problem, which give information on the various available occupations, and which deal with specific materials used by the pupils.

3. The words for spelling should be not far in advance of the immediate needs of the pupils.

4. Grammar should be continued from the sixth grade incidental to composition. Special lessons should be given only as needed.

MATHEMATICS

1. The course of study laid down for the regular schools will be followed. The material for examples will, however, be drawn as far as possible from the work actually going on in the shop, sewing-room, and kitchen.

2. Shop records for labor time, quantity and cost of material, etc., will be kept under the direction of the industrial teachers.

3. Bookkeeping will be taught to the extent that it is actually needed in the conduct of the shop, sewing-room, and kitchen.

GEOGRAPHY AND HISTORY

Without neglecting the course of study laid down for the regular schools, the geography and history of industrial and commercial activities should be emphasized in the general reading and in the periods devoted to these subjects.

PENMANSHIP

Classes should be organized for those who need this work.

ACCESSORY

An excursion should be taken by each pupil at least once each term to a place where a phase of the world's work may be observed.

Pictures and lantern slides should be used for illustrations.

To interrelate the book and the activity is not easy. Some progress is being made. At present the heads of the departments of art, domestic science, and manual training are at work upon plans that promise well.

Guidance.—A graduate of one of the semi-industrial schools has the same opportunity as the graduates of other schools have of entering the high schools, either the Technical or the English-Latin. More guidance should be given all grammar-school graduates in their selection

of high-school courses than is at present given in Indianapolis, and more assistance should be given in entering industrial life. This field of choice the coming term, for the graduates of these semi-industrial schools, will be limited in a conference between the principals of the high schools and the principals of the grammar schools.

Results.—1. The plan being tried this year of giving advanced work to graduates of these semi-industrial schools at the home school is not proving a success. The classes returning for this work have in general been too small for economical handling, and it has been found that the elementary-school equipment has not met their needs. This "post-graduate" work will be discontinued at the close of this term. A special school is needed, if high-school work is to be done in a satisfactory and economical manner.

2. Without exception the boys and the boys' parents accept this modified school work with enthusiasm. In general, the girls and their parents are glad to have a more practical turn given to the school work. There has been, however, now and then, on the part of one or more girls and their mothers, objection to "so much sewing and dish-washing." In most cases the trouble has been found to lie in the fact that the work at these points was not really on a practical, worth-while basis. By placing the work in the hands of a teacher who had had more real "trade" experience the objection has disappeared. However, there may be here a real problem that should be recognized.

3. Experience so far confirms the suspicion held by many that for many of the boys and girls five hours a day spent on the study of the abstractions and the generalizations of knowledge is partly misspent. It appears to be generally true that classes and individuals are taking a higher rank in their book studies, as indicated by marks, and are showing a better understanding of these studies than they have formerly done. This phase of the matter resolves itself into the question, "How much time can a child spend efficiently on the study of books alone?"

4. The question just proposed must be carried from the "semi-industrial" school to the "regular" school. It is a sequence, perhaps, rather than a result that the supervising principal and the parents in two of the "best" sections of the city are taking up the study of the semi-industrial program, with the view of determining whether or not it is not in essence a more educational and more cultural program for all children. One of the schools in a similarly favorable district is introdu-

cing some handwork in weaving and pottery by request and partly at the expense of the "Parents' Club." The teaching is done by the regular teachers in school time.

Equipment.—It was early discovered that each "activity" must have its proper place in which its peculiar "atmosphere" could be created. For the boys there must be a wood-working room—with a place for staining and a place for machines; a room for the printing, and if metal-work were done, a special room for it with machines and a forge. For girls there are needed a kitchen, butler's pantry, and dining-room (en suite if possible), a laundry, a sewing-room with sewing-machines.

Machinery.—The introduction of machinery has been forced in the development of the plan of work. It has been found that both boys and girls are capable of using machines much earlier than it was suspected by some and it is not yet clear how far the educational needs of the children will push development in this direction.

BOSTON

North Bennett Street Industrial School.—This is a private enterprise, conducted "for educational and social improvement and for research and experiment in educational and social methods."

Full information may be found in the *Annual Reports* for 1909, 1910, 1911. These will be sent to anyone on application. They are most valuable contributions to the literature of the subject under consideration. This report is made up largely of extracts from these *Reports.*

Purpose.—The school is working to better the life of all members of the neighborhood. For children of compulsory school age it is trying:

1. To illustrate a possible modification of the upper grammar-school course which will be especially adapted to pupils who will leave school early to enter industrial pursuits.

2. To develop within the public school an increasingly vital form of manual training in several materials, sympathetically adapted to meet the fundamental instincts and interests of those to whom it applies, and so correlated with academic subjects as to cause these to function more certainly as elements in a liberal education.

3. To provide, after school hours, supplementary industrial work for members of public-school classes, and also such handwork as is adapted to children of school age or under who have no other opportunity for this training.

4. To develop spontaneous and wholesome recreational life through folk-dancing, music, and supervised play.

Foundation.—This organization was founded in 1880 and therefore has been for thirty years a pioneer in the lines of educational work enumerated.

Relation with public schools.—By arrangement with the Boston School Board sixty-five pupils, boys and girls, have been transferred from a near-by public school to this school for the last two years of their grammar-school work.

Plans are subject to the approval of the Board of Superintendents of the City of Boston. Pupils have been selected by the masters of the respective grammar schools in consultation with the director of the North Bennett Street Industrial School and the parents of the pupils. While it will be possible for these pupils to continue their education by taking a high-school course if they desire, the aim has been to select those who must go into industry early and so especially need this training. A special certificate will be issued to those who satisfactorily complete two years' work. The North Bennett Street Industrial School bears all expense of the experiment with the exception of furniture for the boys' classroom, and such of the textbooks in use in the city schools as are suitable for these classes.

COURSE OF STUDY—BOYS

First Year	Hours
Shopwork—	
Wood—benchwork	6
Printing	2
Practical mathematics	3⅓
English literature and composition	6
Geography and history	3⅓
Drawing, freehand and mechanical	1⅓
Hygiene and personal habits	½
Total	22½

Second Year	Hours
Shopwork—	
Wood-turning, benchwork, and metal-work	6
Printing	2
Practical mathematics and business forms	3
English literature and composition	2
Geography, history, and civics	3
Drawing, mechanical	2
Hygiene	½
Total	22½

Fifteen minutes daily allowed for recess and fifteen for general exercises complete the schedule on the basis of a five-hour day.

"The industrial work consists of shopwork and printing. The most of the members of the class had not had woodwork when they entered, so it has not been found possible to deviate greatly from the usual forms of manual training. In addition to this, the pupils have done

pieces of repair-work about the building with one of their own number acting as foreman. It is the foreman's duty to keep account of each boy's time and the amount of material used, and to present at each session all data necessary for academic study. He also makes an estimate of each boy's ability and prepares a written criticism of his work. It is evident that no suitable textbooks or courses of study are available and that all the instruction involves original work and preparation on the part of the teacher.

"Arithmetic and drawing are developed in close correlation with shopwork. Much of the reading is selected from *Current Events*. The language-work, oral and written, is a discussion of current events, descriptions of shop processes, business letters, so that accuracy of speech will be appreciated. Lessons are given in spelling from lists of words occurring in the day's work. Geography is developed naturally from the shopwork to materials in use, the sources of the materials, means of transportation, and thence to the principal industries of Massachusetts and the steamboat lines and export trade from Boston. This, again, leads to the study of other countries, and questions of history and politics. The pupils are led out by observation of their own environment through the greater complexities of the industrial world, and made to feel that school work is a part of life.

"Outlines of lessons, specimens of work, lists of materials, etc., are kept on file, and copies are furnished on request. As practically none of the school systems that are attempting this form of instruction have made their material available, there has already been a considerable demand made upon us."

COURSE OF STUDY—GIRLS

First Year	Hours
Sewing, hand and machine, simple garment making, study of materials	6
Cooking and housekeeping	3
Design	1
Arithmetic	6
Geography and history	3
Literature, composition, and spelling	4½
Gymnastics and hygiene	1
Total	22½

Second Year	Hours
Sewing, hand and machine, simple garment making, and embroidery	6
Cooking and housekeeping	3
Design	1
Arithmetic	4
Business conditions and methods	1½
Civics	1½
Literature and composition	4½
Gymnastics and hygiene	1
Total	22½

Fifteen minutes daily allowed for recess and fifteen for general exercises.

These classes, like other public grammar schools of Boston, are in session from 9 A.M. to 12 M. and from 1:30 to 3:30 P.M. daily, except Saturday, with the usual vacations and holidays.

The sewing course is planned to meet the immediate needs of the girls as the work of the year is carried on: First, cooking-uniforms, towels, holders; then undergarments, shirtwaists, dresses, curtains for the school, and shop aprons for the boys. The pupils do their own planning and cutting. Some simple drafting is done that pupils may better understand how to use the patterns they buy.

The pupils furnish their own materials, selecting and buying after some study of what is good and reliable. Each pupil keeps an account of the amount of material, cost, and time required for each garment, and marks each finished article, "Excellent," "Good," or "Fair," as she thinks it deserves.

In cooking, recipes for family amounts are used, and the pupils are allowed to do as much of the marketing as possible. Planning of menus with reference to nutriment and cost, as well as correct serving, is a valuable part of the work. The care of the house, with especial lessons in cleaning various materials, is also given a prominent place in the course.

The method of teaching has been in all subjects that of development, with direct application to the industrial work and to everyday problems. Arithmetic has been correlated with wage-earning under different conditions, calculating amounts and costs of materials, household and personal accounts and receipts, carpeting, papering, etc. History has dealt with the development and growth of industry of the different sections of the country, while geography has been the study of the raw materials that are necessary to men in the form of food, shelter, and clothing. English has probably been most closely related, as it has been used for expression of all the other subjects in forms of letters of all kinds, descriptions of excursions, and criticisms on work of all kinds.

Much interesting work has been done in making out costs of outfits in clothing for one year on the basis of a working-wage of $6.00 per week. Below is an uncorrected estimate. The girl allows $3.00 to her family; $1.50 for carfares and lunches, leaving $1.50 per week for clothing, which amounts to $75.00 per year.

OUTFIT AS PLANNED BY ONE OF THE GIRLS WITHOUT CORRECTIONS

WINTER OUTFIT

1 winter coat	$10.00	
1 hat for work	3.00	
2 prs. of shoes	4.00	
3 homemade shirtwaists $0.50 each	1.50	
2 sets of underwear, $1.00 set	2.00	
1 pr. of corsets	1.00	
3 homemade corset covers $0.25 each	.75	
4 prs. of stockings $0.20 each	.80	
1 black petticoat	.75	
2 white petticoats	4.00	
1 pr. of rubbers	.50	
1 umbrella	1.00	
1 pr. of gloves	1.00	
2 flannel petticoats	.58	
1 black outside skirt	3.50	
1 doz. handkerchiefs	.70	
Total		$35.08

SUMMER OUTFIT

2 sets of underwear	$ 2.00	
2 combination suits	1.50	
1 black petticoat	.75	
1 white petticoat	2.00	
2 corset covers $0.39 each	.78	
1 underskirt	.50	
1 summer dress	3.00	
1 pr. of shoes	2.00	
3 pr. of stockings $0.20 each	0.60	
1 pr. corsets	1.00	
1 hat	3.00	
1 spring suit	10.00	
3 homemade shirtwaists	1.50	
1 pr. of gloves	1.00	
Total		$29.63

ODDS AND ENDS

2 yds. of ribbon	$ 0.50	
2 pkgs. of hairpins	0.25	
4 neckties, $0.25 each	1.00	
Fancy pins	0.50	
4 stiff collars, 2 for $0.25	0.50	
Set of combs	1.00	
3 homemade jabots	0.30	
Total		$ 4.05
		$68.76
		75.00
For pleasure		$6.24

CLEVELAND

A report upon the Elementary Industrial School was issued by Superintendent Elson in 1910. A rather full report upon the history, purpose, and work of this same school by Professor Frank M. Leavitt may be found in the September number, 1911, of the new magazine, *Vocational Education.*

Purpose.—The school was opened in September, 1909. It received boys and girls from any school in the city recommended by the teachers and principals. They have been largely the "failures" in the regular schools. There are at present about fifty girls and one hundred and twenty-five boys from the fifth to the eighth grades. The equipment for girls' work has not been as fully supplied as that for boys' work. The purpose has been to provide a modified plan of *general* education rather than of *industrial* training.

Teachers.—Shop or trade experience has not been required of teachers. They are men for shopwork and women for girls' activities and for all academic studies, selected from the manual-training corps and from the regular teaching force because of special interest in and aptitude for the peculiar work of this school.

Curriculum—

First Year, Boys

DRAWING

Simple working drawing—

Freehand Sketching—Representation of simple objects, graphically and in view-drawing.

Working Drawings—Simple objects illustrating necessity for and arrangement of views. Conventions of lines, dimensions, sections, etc. Drawing to scale. Application in working drawings for the shop. Subject related closely to industry by using much illustration material, drawings, blue-prints, etc., and by visits to shops and drafting rooms.

Practical outlook—

Work as mechanical or architectural draftsmen.

Simple lettering—

Plain letters and figures used in mechanical and architectural drawing.

Application in connection with working drawings and sketches in the shop.

Composition in lettering—

Types of letters used in reference to artistic effect in spacing and in relation to margins and space to be filled. Tail pieces, line finishings, initials, illuminating, monograms.

Practical outlook—

Sign, bulletin, and placard painting as a trade.

Design—

For the development of the sense of outline, line, form, and proportion.

Application in wood- and metal-work.

Simple metal-work—

Design applied in simple objects in copper, brass, and other soft metals, particularly fittings for wood workbox corners, hinges, escutcheons, catches, drawer and door bolts, plates, surface decorations, etc.

WOODWORK

Preliminary problems—

Problems presenting systematic use of tools and general principles of construction, involved in simple projects of use and beauty, applying art principles of form and color, and correlating with metal-work, mechanical and free-hand drawing.

Commercial problems—

Problems of commercial value, such as appliances for school gardens, window boxes, bulletin boards, and frames for schoolrooms, etc., otherwise made at the repair-shop.

Finishes—

Stains, paints, and finishes studied and applied in various wood-working projects.

Business methods—

Time card, expense, and checking system, measuring, estimating, costs, bills, letters, materials, contracts, etc., correlating with English, geography, history, and mathematics, in both first and second years.

First Year, Girls

HOUSEHOLD ARTS

Aim—

The training of pupils in the subjects which pertain to life in the home.

Cookery—

Cooking of types of vegetables, cereals, the various cuts of meat, flour mixtures, instruction in the principles underlying the work, preparation and serving of meals, practice in writing menus, care of the kitchen and dining-room.

Sanitation—

Plumbing, cleaning of traps, care of the sink, refrigerator, and bathroom.

Laundry—

Washing of dishtowels and table linen.

Sewing—

Care and use of machines. Making of uniform for household science, sewing-bag, mending, hemming table linen, corset cover, shirtwaist suit.

Art—

Designs for table linen, wall paper, rugs, draperies, dishes, beauty in form of dishes and cooking utensils and fitness for use, lettering, title-pages of notebooks, illustrations for notebooks, suitable pictures for the home.

Lettering for marking articles made in sewing, textile designs, fitness of articles for their use, suitable designs for embroidery, pictures of beautiful costumes.

Household accounts—

Cost of food in the lessons, cost of meals which are prepared, cost per capita per day, cost of furnishings, textiles, clothing.

Museum—

Textiles and materials from which they are made, pictures of looms, spinning wheels.

Class visits—

Markets, stores, factories, and shops.

Correlation—

All of the work is correlated with English, geography, history, and mathematics, in both first and second years.

Second Year, Boys

FIRST TERM

Work as outlined for the first year continued.

SECOND AND THIRD TERMS

Full time for industrial work (about eighteen three-quarter hour periods each week) may be devoted to specialization in one of the following subjects: mechanical drawing, printing, cabinet making, pattern-making, building construction.

Class visits—

After class talks and discussions, visits to drafting-rooms, buildings in the process of construction and finish, to cabinet shops, paint manufactories, printing-offices, pattern-shops, etc.

Second Year, Girls

HOUSEHOLD ARTS

Cookery—

Preservation of food: canning of peaches, pears, tomatoes, jelly, sterilization. Preparation of such combinations of food as could be used for a meal.

Soups, bread, salads, simple desserts, preparation and serving of meals, infant-feeding, invalid cookery. Practice in writing menus.

Sanitation—

Review of first-year work.

Laundry—

Hard and soft water, action of alkalies, making of soap, preparation of starch, removal of stains, washing and ironing of various textiles.

Home nursing—

Making a bed, care of sickroom, simple treatment of cuts and burns.

Sewing—

Making of drawers, nightgowns, dresses of wash materials. Emphasis is placed upon increase in speed.

Art—

Household decoration and furnishing. Colors and materials suitable for the various rooms and uses in a home. Study of the principles underlying artistic construction in dress. Study of historic examples of dress.

Mechanical drawing—

Working drawing for anything needed for the kitchen, such as table, drain board for sink, shelf or drawer for pantry, accurate measurements for windows for window fixtures, drawing to scale of windows.

Household accounts—

Cost of food, fuel, service, rent. Typical family budgets.

Class visits—

Markets and house-furnishing shops.

Economic value—

The use which the woman makes of money in the home is of equal importance to the acquiring of the money. "It is the present duty of the economist to magnify the office of the wealth expender, to accompany her to the very threshold of the home, that he may point out its woeful defects, its emptiness, caused not so much by lack of income as by lack of knowledge of how to spend wisely."

ST. PAUL

The St. Paul Special Industrial Schools have been in operation since 1908. They are for boys exclusively and are located one in each geographic district of the city.

Purpose.—Quoting from Superintendent Heeter's report: "They are special schools for boys who cannot be expected to complete the regular grammar-school course." "Boys come from the fourth, fifth, sixth, and seventh grades." "No boy under fourteen years is admitted." "The elementary industrial school takes pupils that cannot be expected to complete the common schools and endeavors to give them a sort of finishing course before they go to work." Boys may prepare for certain courses in the high schools and a few have done so.

Teachers.—Two men teachers take charge of thirty boys—one teacher for the shop and the other for the academic schoolroom adjacent. These men are graduates of the normal schools of the state with special aptitudes for this work.

Curriculum.—The industrial work is largely wood-working, carried into cabinet making and elementary physics. The course of study is arranged to cover three years.

Each school consists of only three classes, with an average of about ten to the class, known as first-year, second-year, and third-year boys.

"Each day is divided into six periods and each class spends one period in supervised study, another in recitation, and another in the shop. As

indicated above, their studies are limited to reading, writing, spelling, and arithmetic. The reading lessons are almost entirely industrial, geographic, and historical in their character, and the reading period is frequently used as a language period. The arithmetic runs at times toward simple accounts and business forms and elementary bookkeeping. Occasionally an entire half-day is spent by the entire room of thirty boys under the direction of both men in an observational study of some trade or occupation. As a rule, arrangements are made in advance by the teachers with some blacksmith, carpenter, electrician, manufacturer, foreman, etc., and the boys are given every attention possible."

NEWARK

The history and general plans of the elementary vocational work in Newark are discussed by Superintendent Poland in his school report of 1909–10. Boys are sent to one building from different schools in the city. Girls are not provided for. "The school has attracted the dull boy, but it does not cater to him." The school is about two years old.

Purpose.—Dr. Poland states in his report: "There are two things which I hope to see accomplished a little later that may make it easier to retain these boys in school: (*a*) their superiority as apprentices over boys otherwise trained, and (*b*) their ability to advance more rapidly as apprentices and hence obtain higher remuneration because of the training received in this school. When it becomes known that this school offers to a certain class of boys advantages that cannot be had in the regular grades its career of greatest usefulness will have begun."

Teachers.—Men are in charge of the shopwork, selected because of successful trade experience supplemented by technical and teaching training. Women are in charge of the academic studies selected because of conspicuously successful experience with and because of their interest in this class of boys.

Curriculum—

FIRST YEAR

Shopwork	825	minutes per week
Drawing	275	" " "
English subjects	275	" " "
Arithmetic	220	" " "
Ind. geography	55	" " "

SECOND AND THIRD YEARS

Shopwork	825	minutes per week
Drawing	275	" " "
English subjects	275	" " "
Arithmetic	220	" " "
Science	55	" " "

Shopwork is given in the following order: Carpentry, metal-work, pattern-making, foundry practice, electrical wiring, printing, and electrical construction. Pupils who do not wish to take the electrical construction in the graduating class may specialize in any other line of shopwork.

The drawing does not correlate in detail with the shopwork but follows a sequence of its own. This method eliminates repetition and insures a stready advance.

The English work includes oral and written composition, spelling, and penmanship. It is directly correlated with the different branches of shopwork.

Arithmetic is treated from the shop side after the fundamentals have been thoroughly mastered.

Science work deals with the properties of matter, heat, light, sound, electricity, and mechanics.

A high standard of efficiency is maintained throughout all classes.

Product that has been completed is the property of the Board of Education.

The school places its graduates in positions suitable to their ability and inclinations. This feature of vocational guidance was successfully started last July, when seventeen out of twenty-one graduates were placed in positions. The remaining graduates entered high school or moved from the city.

Two lines of industrial work call for special mention, the pattern-making and elementary tool-making. A foundry room in the basement gives an opportunity to apply the pattern in the process of casting. In the toolroom two forges make it possible to give practice in tempering and welding. The tools are made of sheet iron by the use of the regular iron-working tools of this trade.

The value of industrial training for the teachers of the industrial activities was evident throughout this school.

SUMMARIES

All the industrial activities found in the elementary industrial schools here considered are tabulated below. The letters opposite each activity indicate the cities in which they are found: B., Boston; C., Cleveland; I., Indianapolis; N., Newark; S., St. Paul.

ACTIVITIES

Boys	Girls
1. WOOD-WORKING	1. SEWING
(B.C.I.N.S.) Carpentry	Plain (B.C.I.)
(B.C.I.N.S.) Joinery	Dressmaking (B.C.I.)
(B.N.) Wood-turning	Art needle-work (B.C.I.)
(N.) Pattern-making	
(C.) Cabinet-making	
(C.N.) Building construction	
(B.C.I.) Repair-work	
2. METAL-WORKING	2. COOKING AND HOUSKEEPING
(B.C.I.) Art metal	(B.C.I.)
(N.) Tool-making	
3. PRINTING	3. WEAVING
(B.C.I.N.)	(I.)
4. ELECTRICAL WORK	4. MECHANICAL DRAWING
(B.N.)	(B.C.I.)
5. CLAYWORK	5. SPECIAL ART TRAINING
(B.)	(I.)
6. BOOK-MAKING	
(I.)	
7. MECHANICAL DRAWING	
(B.C.I.N.S.)	
8. SPECIAL ART TRAINING	
(I.)	

Agreement.—In some particulars all the schools under consideration are in agreement. One point of agreement is in the "call" for the industrial activity, or to put it differently, in the schoolman's motive for introducing industrial activities into the elementary-school grades. The most fundamental motive appears to lie in the unmet need of the

boy and girl who does not or cannot find education and culture (assuming that these two words are not synonymous) through and by books alone.

A second point of agreement is in the choice of material for educational purposes. The uniform reasoning seems to have been this: "If a child's mind does not react by dealing with the abstract and the symbol —let us try the reality." With the disappointing experiences in manual training, school cooking, and schoolroom nature-study fresh in mind and influenced by the growing demands of the industrial world, it was natural that *industrial activities* should loom large in the minds of all who were studying the unsuccessful school child.

A third point of agreement is the introduction of a secondary aim in elementary training. While all agree that the primary purpose of all elementary training should be general education, it is believed that a secondary aim of vocational preparation is as legitimate as a secondary aim of high-school preparation, and that the practical recognition of this secondary aim need not interfere with the fullest realization of the primary aim.

A fourth point of agreement lies in the conviction that the book is indispensable in any form of elementary training, that at least half-time should be given to the book, but that the book and the activity should be so related as to vitalize each other.

A fifth point of agreement relates to method and to quality of industrial product. It is agreed that both should be those of the trades of which the activity is a part. School practice should be "shop practice" as far as is practicable. However, there appears to be a universal conviction that in this elementary field the educational values must always dominate rather than the industrial values.

A sixth point of agreement is that the elementary industrial courses must be so planned that a boy or girl completing them may at his option enter advanced courses of study or enter industrial life.

A seventh point of agreement is that these children need educational or vocational guidance when they pass out from the elementary course and that they need opportunities for continued education if they enter the industries.

The beginnings of this departure in school practice were alike in all cases. Some conveniently located building was converted into a special school to which boys and in some cases girls also were invited from the

entire city. At first the overaged, the mentally slow, formed the school membership. The quality of pupils is, however, improving.

The courses of work are planned to cover two or three years, the last two years of the grammar grades, although overaged, overgrown, and unsuccessful children are taken rather freely from the sixth and in some instances from the fifth grade.

In general the industrial activities selected are the same in all schools, namely, those most fundamental in the world's industrial life. There is, however, at each school an experimental attitude. The North Bennett Street Industrial School in Boston, being primarily an "experimental station," has tried out a larger number of activities than have other schools. The work in Newark in pattern-making and tool-making are suggestive of this experimental attitude.

Differences.—There are several points at which there is not exact agreement.

There is a difference in the degree of vocational emphasis. This emphasis appears to be greater in Newark and least in Indianapolis. Indianapolis and the North Bennett Street Industrial School seem to be more at one at this point, while Cleveland and St. Paul are more closely allied with Newark. These three schools are separate schools to which selected pupils are sent, all boys, except in case of Cleveland. In Indianapolis six regular schools are following the industrial plan, boys and girls, in all about seven hundred children.

Cost.—The cost of this plan of work will of necessity be greater than that of the sedentary, exclusively book plan. It would appear also that the cost will increase with the vocational emphasis, for this emphasis carries with it a larger variety of activities, a more varied and complete mechanical equipment, and more highly trained and more thoroughly experienced teachers.

DEDUCTIONS

1. The elementary industrial plan of education requires for its success a school building constructed for it. A conventional schoolhouse will not do. Each activity should have its room or rooms built for that particular activity.

2. "When a manual activity becomes merely manual labor it ceases to be an educating activity. At this point a labor-saving tool or machine must be introduced." This statement was made to the writer a year

ago by Mr. Robert Himelick who is in charge of one of the industrial centers in Indianapolis. If it is, as it appears to be, a principle inherent in this plan of education it will determine the amount and variety of machinery that must be made a part of shop equipment.

3. "A boy between the ages of fourteen years and eighteen years is potentially at his best as a mechanic. That is, during these years he can with a minimum amount of training turn out a finer mechanical product than he can in later life." Superintendent Poland has made this generalization. He is the first to state it so far as the writer knows. It exerts an important influence in standardizing the work of his school. If this shall be found to be a principle, it cannot but profoundly influence all educational practice in the upper elementary and lower high-school grades.

CONCLUSIONS

The problems involved in educating girls by the elementary industrial plan are not as yet either so successfully worked out or as fully worked out as are those for boys.

The least successful part of the plan is the interrelation of the book and the activity. In no place, so far as the writer knows, is this interrelation much more than an ambition. It is not yet entirely clear how far this interrelation may be carried with profit.

It is becoming evident that the influence of the industrial plan of elementary education is destined to be considerable on both "manual training" in general and on all elementary education.

This form of education will not eliminate all the "failures" from the schools, but it is diminishing their number. For many children school has been a place where they have been trained to bear defeat unresistingly. For a growing number of them the elementary industrial school has become a place where they are taught how to attain success.

III. THE SEPARATE OR INDEPENDENT INDUSTRIAL SCHOOL

M. W. MURRAY
Director of Industrial Education, Newton, Mass.

The development of the independent industrial school is due to a broadening educational policy which recognizes the right of every pupil to the kind of training best suited to his individual needs. We have come to realize that a scheme of education which is intended primarily for the select few who enter the professions will not educate effectively all children, even if they were compelled to remain in school. These facts were forcibly brought to the attention of thinking people by the report of the Massachusetts Commission on Industrial Education published in 1906. The report showed clearly that the schools are not educating a large percentage of their young people, who are entering industrial life poorly equipped for their struggle. To add to their difficulties, industrial conditions are now so changed that it is no longer possible for them to receive the training necessary for their development and advancement. These two conditions form a common problem for which the industrial school must furnish the solution.

It is the intent of the Massachusetts law to promote by state aid the development of a new type of school which in fitting for wage-earning occupations shall be unhampered by the practices and methods of the regular public schools. To encourage the establishment of these schools, the state enters into an equal partnership with the local community and pays one-half of the running expenses of the school if its plant, teachers, courses of study, and methods of instruction meet with the approval of the State Board of Education. The law makes it possible for these schools to have their own governing boards, independent of the school committee, but co-operating with it. This, however, is not necessary, and where the city government desires, the school committee may be the governing board of the state-aided industrial school. To the end that these schools may have an opportunity to work out their own methods according to new ideals, they are separate from the regular schools, but

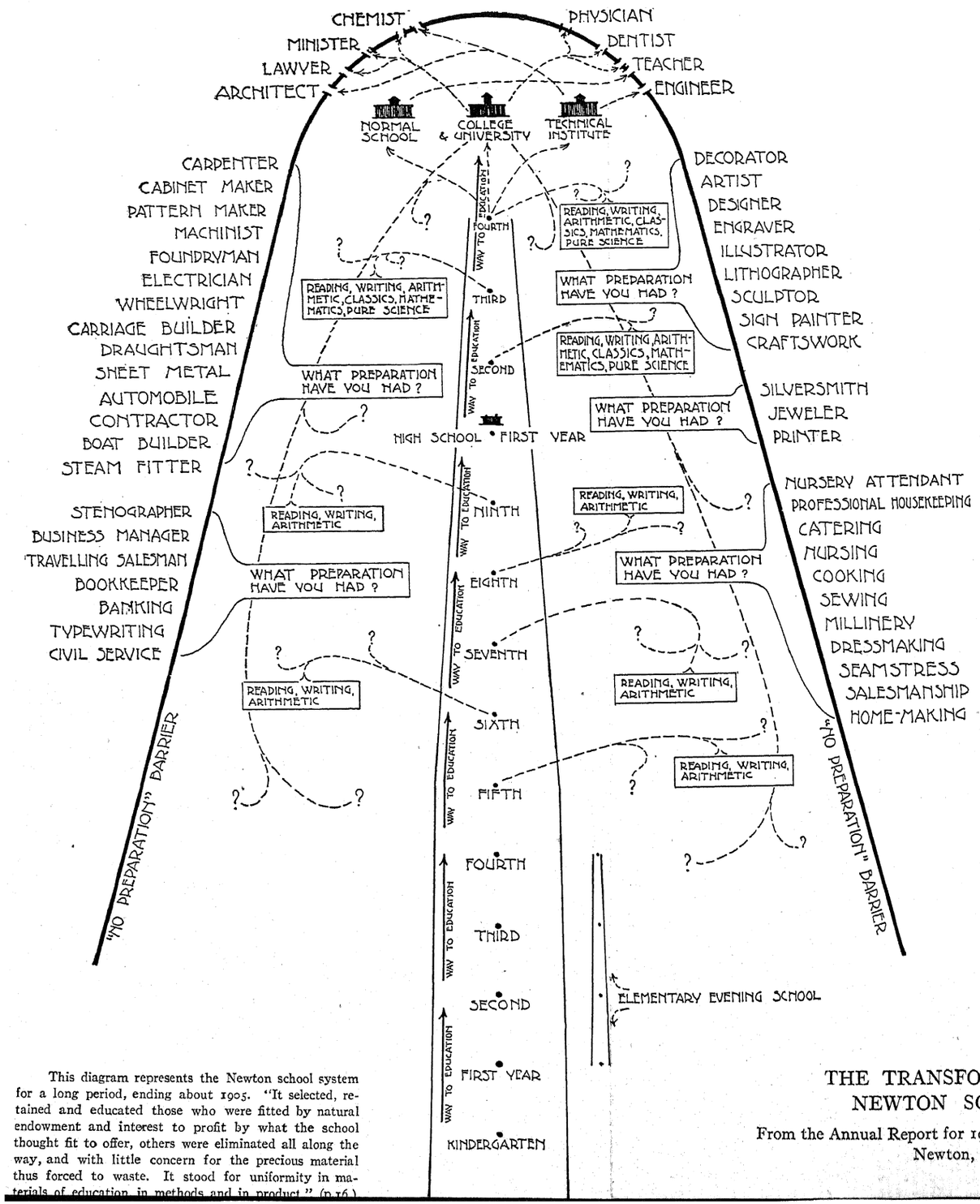
it is intended that they shall, so far as possible, work together. The same general problems are confronting all of the industrial schools which have been organized during the last three years, but the schools differ to such an extent that a general description is impossible; hence this paper will deal mainly with the Newton State-aided Day Industrial School for Boys.

Supervision and administration.—A feeling that all educational activities should be under one general control has led to the organization of a new Board of Education in Massachusetts, to take the place of both the Commission on Industrial Education and the old State Board of Education. This new board has one commissioner, with two deputies, one of whom has charge of all the industrial work in the state. In a like manner, the industrial schools are in charge of a specialist under the Superintendent of Schools. In the case of Rochester, N.Y., and Newton, Mass., the same person has charge of all the manual, industrial, and technical training throughout the public-school system, making it possible for the work of one school to supplement that of another. In four Massachusetts cities the industrial schools are operated under separate boards of trustees but to all intents and purposes they are a part of the school system and dependent upon it for their pupils. It seems probable that the new schools which are established will be directed by the school committees, with advisory boards composed of practical men, whose duty it shall be to act in an advisory capacity as to the courses of study, equipment of the school, and the guidance of pupils in selecting a vocation.

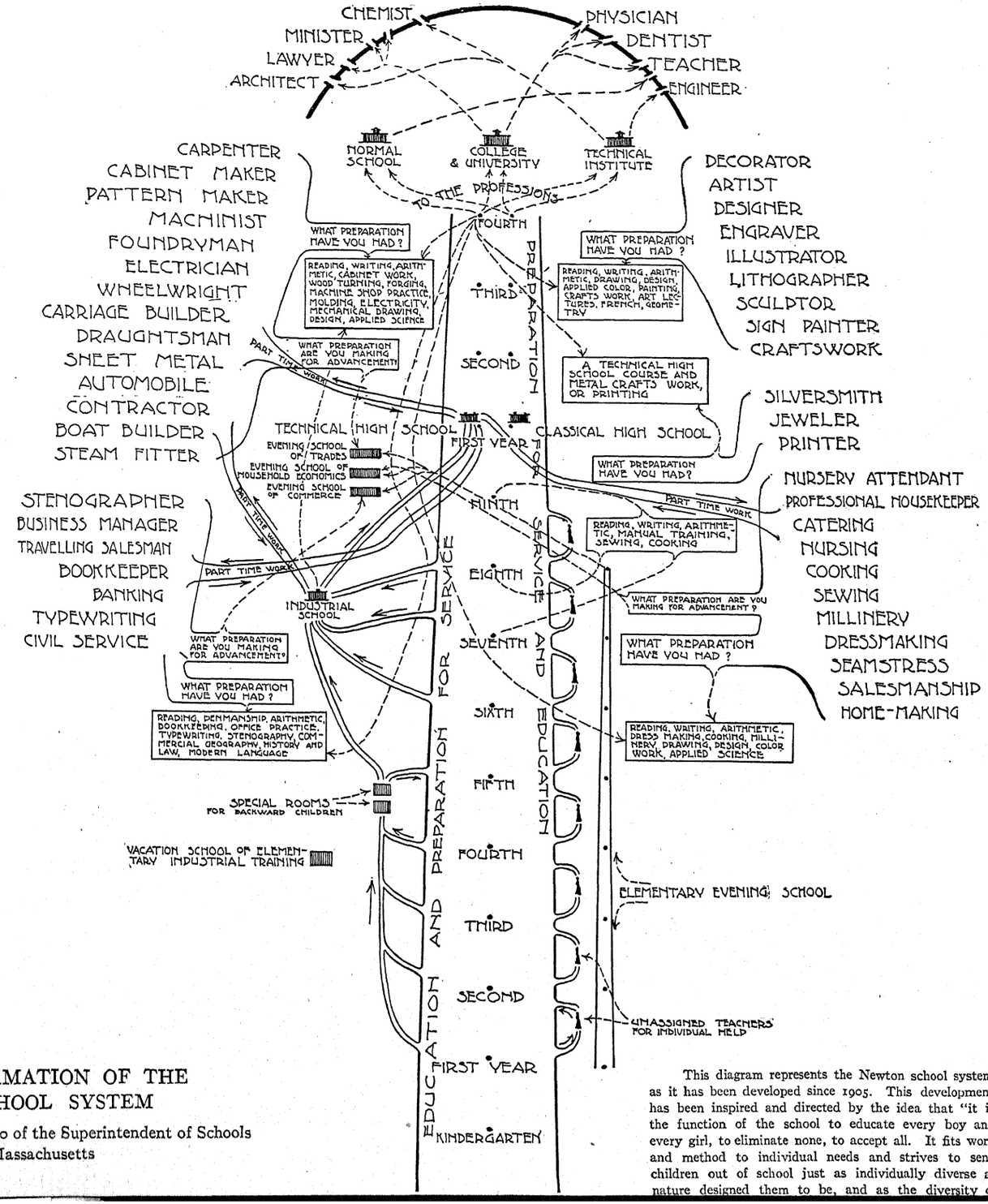
The independent industrial schools, as now conducted under the Massachusetts Board of Education, include day schools for boys and girls over fourteen years of age, evening trade-extension courses for men and women over seventeen years of age who are engaged in similar lines of work during the day, and part-time courses for those of both sexes between the ages of fourteen and twenty-five years who are employed.

Need of these schools in the public-school system.—The need of a school of this type and the exact work which it should do vary with the industrial conditions of the city and with the educational opportunities already offered by existing schools. A school system which deals with the pupils as individuals and offers strong courses in manual training, drawing, cooking, and sewing will reach and hold more children than one

CHART I



This diagram represents the Newton school system for a long period, ending about 1905. "It selected, retained and educated those who were fitted by natural endowment and interest to profit by what the school thought fit to offer, others were eliminated all along the way, and with little concern for the precious material thus forced to waste. It stood for uniformity in materials of education, in methods and in product." (p.16.)



This diagram represents the Newton school system as it has been developed since 1905. This development has been inspired and directed by the idea that "it is the function of the school to educate every boy and every girl, to eliminate none, to accept all. It fits work and method to individual needs and strives to send children out of school just as individually diverse as nature designed them to be, and as the diversity of

THE TRANSFORMATION OF THE NEWTON SCHOOL SYSTEM

From the Annual Report for 1910 of the Superintendent of Schools
Newton, Massachusetts

which does not offer these courses.[1] It is also true that the addition of commercial and manual-training courses, and the establishment of technical high schools, increase the holding power of the school system, yet even where these exist there is still a large group of boys and girls which the industrial school can reach.

Chart I shows graphically the present place of the industrial school in the Newton school system, which before the development shown on the right, held a larger number of pupils through the high school than any other city in the country. This development includes broad courses in manual training, cooking, and sewing, prevocational training in the grades, and the establishment of a $500,000 Technical High School with a special industrial course. If Newton, a residential city, with comparatively little manufacturing, needs such a school, the need in most other places must be indeed great.

Children who are reached.—These state-aided industrial schools receive pupils as soon as they can obtain age and schooling certificates,

TABLE I

ENROLLMENT OF THE NEWTON SCHOOL BY GRADES, SHOWING NUMBER OF PUPILS COMING FROM EACH GRADE AND THE PERCENTAGE OF LOSS ACCORDING TO GRADE

Grade	Total Number Received	Dropped out	Percentage of Loss
Fifth or below	9	4	44.4
Sixth	21	7	33.3
Seventh	25	8	32
Eighth	20	7	35
Ungraded	6	1	16.6
Above eighth	2	..	....
Total	83	27	32.5

NOTE.—Two pupils coming from the eighth grade went from the Industrial School to the Technical High School. This means a loss to the school system of only five boys from that grade, or 25 per cent, and a total loss of only 25, or 30.1 per cent.

In the Massachusetts schools as a whole, the majority of the pupils in the day industrial schools have completed the grammar-school course before entrance.

which in Massachusetts is at fourteen years of age, if they show that they are otherwise qualified to profit by the work which is offered. As shown by Table I, the majority of the pupils in the Newton School

[1] Based on studies made by the writer during eight years' work in Springfield, Mass., with groups of boys who had four to six hours of manual training per week.

come from the sixth, seventh, and eighth grades of the grammar schools. It has been clearly shown that these children could not be persuaded to continue in the regular schools, but they elect to attend a school in which practical training is given. Considering the educational advantages of Newton, and the character of the city, the number in attendance in its industrial school (62) is larger in proportion to the size of the city than that of any other school, yet there are about as many more in both the elementary and high schools who would be better served by the industrial-school training.

Aim of the school.—This school aims first to discover what its pupils are capable of doing and what line of trade work, if any, they are fitted to pursue. Where several lines of shop-training are offered, pupils are given a chance to try each in turn until it is discovered what they are best fitted to do. It has been found that most boys have formed a pretty clear idea as to what they wish to do, and very little changing is necessary. Our experience with these schools seems to show that the period from fourteen to sixteen, or the first two years of the industrial school, is the time for vocational guidance through very thoroughgoing trade instruction which will give a boy favorable entrance to a trade if he leaves the school at sixteen years of age. The aim is to offer a four-year course, three years in the school and the fourth in the trade, under the supervision of the school. A course of this kind will give the boy entrance to the trade as an apprentice of advanced standing at a time in his training when he is beginning to specialize.

Courses of study and methods of teaching.—In the Newton Independent Industrial School the shopwork includes courses in carpentry, cabinet making, pattern-making, printing, machine-shop practice, and electrical work. The shopwork forms a core for the teaching of drawing, English, mathematics, science, history, and civics and makes it possible for pupils to see the real use of much of the bookwork.[1]

Shopwork.—The shopwork is all conducted in the way in which similar work in commercial life would be carried on. Everything is real work and nothing is made for the scrap heap. In the wood-working shop, furniture and equipment for the school are made, such as drawing-tables, chairs, benches, teachers' desks, bookcases, cabinets, etc. Work in pattern-making is made practical by having the boys make patterns for the machines and tools which are being constructed in the machine-

[1] See *Bulletin No. 3* of the Massachusetts State Board of Education.

shops. As a part of the electrical course, the boys set up motors and other pieces of apparatus, run wires for these, and do many other kinds of electrical work. In Rochester, where most successful electrical work is being done, the boys have not only wired their own building, but are doing similar work for all the school buildings in the city. In the Worcester Trade School much of the shop practice is on commercial work which is sent in and paid for by the manufacturers of the city, while in Beverly the school shop is located in the plant of the United Shoe Machinery Company, and does productive work for it. Rochester, Newton, and other schools have thus far found ample opportunity to dispose of their products within the school system. The Newton school is just completing an order for six wood-turning lathes with friction clutches to be used as a part of the Technical High School equipment. As a part of the printing course in the Newton school a paper is published which is edited and printed by the boys. This department has done practically all the printing for the school department, with the exception of the annual report. A strong course in drawing, which is directly related to the work, is a prominent feature. In the case of such trades as machine-work, pattern-making, wood-working, and electrical work the drawing is mainly mechanical, with free-hand shop sketches, but for the boys who are specializing in printing, the work includes free-hand drawing, lettering, design, color, harmony, etc.

English.—The aim of the work in English is to enable the pupil to express himself clearly, adequately, and in correct English both orally and in writing; to develop his vocabulary of industrial terms; to develop the ability to consult sources of information along mechanical lines, and to organize working facts into convenient and useful form, to acquaint him with the rapidly developing literature of the modern industrial world; and to cultivate the habit of reading good books. The teaching of this, as of all other related academic work, is based on the theory that the boy will retain and make use of only that part which he is able to appreciate and see a real need for. This is done through having the boys explain in written and oral language their work in the shops, and their understanding of shop orders. Excellent practice in letter-writing is obtained through making requests for catalogues, answering advertisements, writing orders for goods, and requests for more complete information as to shop orders which are sent in from outside the school. An interest in books is developed through a study

of trade papers and magazines bearing upon the subject on which he is working. In this way an interest in the public library can be developed, the great majority of boys in the school patronizing it first through a selected list of books loaned to the school by the library, and later going to the library itself.

The following is a report on books loaned to the Newton Independent Industrial School by the Newton Free Library, showing the number of boys who read each book and reported on the same:

Boys' Life of Abraham Lincoln	7
Biography of a Silver Fox	8
Control of Body and Mind	3
Dorymates	7
Elementary Turning	2
Fighting the Fire	10
Harper's Electricity for Boys	7
Harper's Machinery Book	3
Heroes of American Discovery	4
Heroes of the Storm	8
Horse Fair	8
Iron Star	4
Making of an American	8
New Boy	9
Prince Dusty	8
Son of Light Horse Harry	4
Three Scouts	12
The Training of Wild Animals	12
The Story of King Arthur	9
Uncle Sam's Business	3
Washington and His Country	3
Winning His Way to West Point	10
Working with the Hands	5
Harding at St. Timothy's	6
Harper's Out-door Book for Boys	3
Jack of All Trades	6
Leather Working	10
Life of Theodore Roosevelt	4
Lost in a Jungle	5
Panther Stories	8
Real Electric Toy Maker	3
Story of an American Soldier	6

Textiles (Dooley)	2
The Sciences (Holden)	1
The Young Rangers	16
Trapper Jim	5
True Story of Benjamin Franklin	3
Two Young Inventors	9
Washington's Young Aids	7
Weatherby's Inning	8
Young Ice Whalers	8
Young Trailers	12

Mathematics.—Such a subject as machine-shop practice, through its shop calculations and shop costs, offers an opportunity to teach, with an absolute application to what the boys are doing, all the practical mathematics which the average man will ever need to know or use, but when we come to such a subject as printing, the problem of applied mathematics is more difficult. The following is offered from the printing course as to the way in which this is handled: "To make an accurate estimate on a printing job, all the costs which enter into it must be known. Among these the following must be taken into consideration: Cost of stock, including type, paper, ink; composition; plates; presswork; stonework; make-up; binding, etc. Time-slips showing the number of hours devoted to each job must be kept. The general expense of an office, including rent, interest on the investment, cost of light, heat, and power, together with salaries and an allowance for deterioration, must be considered in determining the price to be charged for a given piece of work. Ample first-hand information is easily accessible, and the actual business of the office is the basis for the correspondence and mathematics." The other academic subjects are similarly treated.

Teachers.—The most difficult problem in the industrial schools is to find teachers who are capable of carrying out the program outlined in part above. The teachers who are dealing with trade subjects are first thorough mechanics in their different lines, and it has been the aim to secure men who correspond with first-class foremen or superintendents in a commercial establishment. In addition to this, the academic training which will enable them to teach the related work is usually required. Such talent comes high, but if we are going to have real efficiency in either an industrial or a regular school, we must pay for the same kind of services and ability that a commercial establishment

demands; in other words, the industrial school should not have a teacher who is not capable of making an equal amount in the outside world. In some cases it is actually necessary to pay them more than they are receiving in commercial work to attract such people to teaching. Only in this way can we get teachers who have a body of knowledge worth drawing upon.

Building and equipment.—On account of the expense of the building and its equipment, starting these schools has been difficult, and it has been the almost universal practice to take buildings which have been discarded for regular school purposes and adapt them to the needs of the industrial school. There is a widespread feeling that a school plant which is not good enough for the regular schools will answer all the purposes of an industrial school, and that it can best be housed in a shop. Where old school buildings have been taken, there has been a feeling on the part of parents that the industrial schools are not as good as the regular public schools, and this has probably kept quite a large number from sending their children. If we are going to make these schools a success, we must give them not only a superior class of teachers, but adequate housing and equipment. It is often said that a shop can be used for this purpose, which may well be the case, but if a shop is used it should not be an old, broken-down commercial plant. This will mean the erection of buildings in which any of us ought to be glad to have our sons and daughters work; in fact, plants of the type of the Cincinnati Milling Machine Co. and others which might be mentioned are far in advance of the average school building as to light, ventilation, convenience, etc.

Does the industrial school successfully deal with a group which is not being reached by the other public schools?—The question may fairly be asked: Are these schools dealing successfully with a group which is not being reached by the other schools? It is the opinion of the principals and teachers of the elementary schools in Newton that these pupils would not be in any school if they were not attending the industrial school: in fact, in almost every case the boy was about to leave the elementary or high school before he entered the industrial school, and in some cases actually had left. This means that the school is reaching only those who were hopelessly lost to the other schools. It is not doing all that it should until it reaches out into the grades and takes boys a year or two before the point of leaving and entering an industry.

TABLE II

STATISTICAL SUMMARY OF NEWTON INDEPENDENT INDUSTRIAL SCHOOL

Total enrollment to date	83
Present number in attendance	58
Highest number in attendance	59
Highest average attendance per month (April, 1911)	51.8
Lowest average attendance per month (June, 1910)	26.5
Enrollment for school year 1909–10	48
Enrollment for school year 1910–11	62
Dropped out during 1909–10	14=29 per cent of yearly enrollment
Dropped out during 1910–11	7=11.2 per cent of yearly enrollment
Total number dropped out to date	27=32.5 per cent of total enrollment

Two of this number entered the Technical High School, making the percentage of loss to the school system 30.4 instead of 32.5.

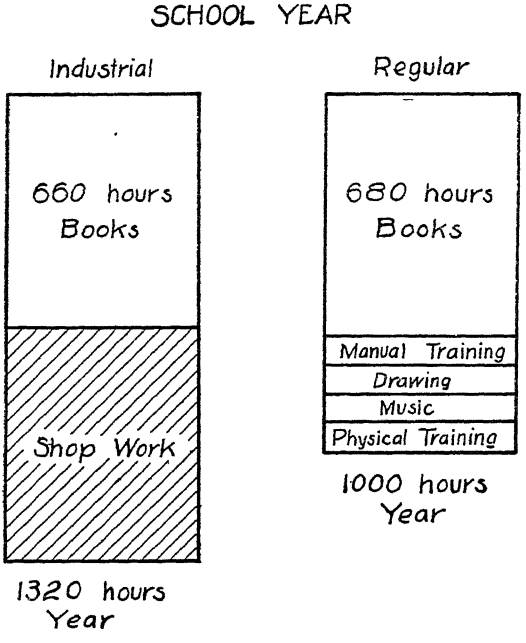
Delinquent	10
Sent to reform school	1
Compelled to go to work	7
Went to work from choice	3
Entered high school	2
Expelled for discipline	2
Father disapproved of industrial school	1
Mother disapproved of industrial school	1

Table I shows the grades from which these pupils have come, the number and percentage of loss. This percentage may seem large, but when we consider that these pupils would not have been in any school, and that during the comparatively short time they were in the industrial school they were fitted for better work than they otherwise would have been, it would seem that it has been worth while. Table II gives a statistical summary to June 1, 1911. This table shows that the largest number who dropped out are those classed under the head of "Delinquent," making a total of ten. The experience with this group seems to show that to deal successfully with boys of the type who are not being reached by the public schools they should be taken when they are about fourteen years old, preferably younger, before bad habits have become fixed. The great majority of the number classed under "Delinquent" were boys from sixteen to nineteen years old, who had

cultivated habits of idleness, profanity, smoking, etc. It was found that the school was not, at that particular stage in its organization, able to deal successfully with this group.

How are pupils held in school?—It is not a difficult problem in the industrial school to hold boys through interest in their work and the development of a sense of responsibility, by having them do work which

CHART II



seems to them worth while, but the difficult problem is to hold them in the school after they feel that they have learned enough of a certain trade to enable them to get a job which seems to offer good financial returns at that time. This is overcome through (1) an understanding with employers that they will not take boys from the industrial school without a written statement from the instructor in charge of the department, or the principal of the school, that such a boy is fitted for the work and that it is necessary for him to do it; (2) by personal conferences with the boys and their parents, making them see that completion of the course will insure an all-round training, which in the end, will enable

the boy to earn more money. It will be noted in Table II that next to the delinquent class the largest is made up of those who are compelled to go to work. These boys did not receive their certificates until the principal of the school had investigated the case very carefully and used all possible arguments with the parents to keep the boys in school. In most of the cases—probably 90 per cent—it was the opinion of the principal that it was absolute financial necessity that compelled these people to go to work.

What does the boy know when he finishes the course?—On the trade side the student has at least the equivalent of two years of apprenticeship, and an all-round experience and opportunity to work on things which a boy of his age could not possibly get working under commercial conditions. In addition to this, he receives a training on the academic side which it is impossible to give in the regular schools. This training, in almost all cases, is the equivalent of at least the last two years in the grammar school and the first two in the high school. The question may well be asked how this can be done. It would appear that if a pupil gives half his school time to shop work he will not be able to compete with a pupil who is giving all his time to the academic subjects. The answer to this is that the industrial school has a longer day by one hour and a longer year by four weeks, making a greater length of session by at least 320 hours a year, or a total of 1,320 hours. Against this we have a total of not over 1,000 hours in the regular schools, and subtracting from this the time for such activities as manual training, drawing, music, physical training, etc., we have left a total of 680 hours. This shows that in actual hours the industrial school devotes practically as many to book work as the regular elementary schools. In addition to this, the teaching is done in such a way that the boy sees why he is doing everything which he does, and the reason why he should get it right. The class unit is made up of not more than fifteen and the instructors are able to give pupils their individual attention. The main difference between the methods used in the industrial school and those of the average elementary and high school, is that in the latter schools a large amount of the work is prepared at home, and the teacher spends time in having the pupils show her, through recitations, what they have not learned and do not know, while in the industrial school the teacher spends his time in directing the individual study of each pupil and teaching him that which he does not know, and could not learn alone.

Can the regular schools profit by the experience of the industrial schools?—While the pupils in most industrial schools are those whom the public schools have failed absolutely to reach, it should be understood that the industrial schools are not intended primarily for this class. It is contended that probably 75 per cent of all pupils in the elementary schools could be more successfully dealt with through the methods of the industrial schools than through the methods which are being used at the present time. At the end of such a course, these students would have not only a good groundwork for a trade, but they would have received more effective academic instruction and the trade experience would be a valuable asset whether they were going to be teachers, lawyers, doctors, or ministers.

IV*A*. THE SEPARATE TECHNICAL HIGH SCHOOL

JAMES F. BARKER
Principal of the East Technical High School, Cleveland, Ohio

With the growth of industries and commerce there has come a demand for training along specialized lines not originally included in our scheme of public high schools. It has been in response to these needs that the remarkable development taking place in secondary education has had its chief inspiration. This has been particularly the case in the larger cities where changing conditions have been greatest and where the lack of persons especially trained to meet the needs of manufacturing and distributing has been most keenly felt. Demand for special training has, furthermore, come from within the ranks of the workers as well as from those directing these activities. A few years ago public secondary education had not been thought of, and the few private academies were concerned only with preparing their pupils for the colleges. This has been, in a measure, the heritage of our secondary schools, and it is only recently that the proposal to train boys in the high school for occupations, as well as for the professions, has met with approval. It is doubtful whether this would have been possible had not the way been prepared by the previous introduction of handwork or manual training. This study made its entrance only upon the earnest representation of its adherents that it was solely for cultural purposes and not with any utilitarian end in view. The usefulness as well as the educational value of handicraft soon became apparent, however, and we are now on the threshold of the greatest development along the lines of industrial and vocational education that has yet taken place.

Meaning of technical high school.—In New York, Chicago, San Francisco, Cleveland, and a few other large cities, there have recently been established special schools whose aims have so differentiated them from other schools as to require a new designation. The National Education Association, in order to get a clear view of what constituted schools of this nature, appointed a committee to consider and report upon a definition of a technical high school. It is this definition, subsequently

reported, that is taken as a basis in this paper. The definition is too comprehensive, however, to be included here.

At the outset it is necessary to exclude the so-called academic high schools, which merely have partial manual-training departments.

Nor would it seem proper to include under the head of the separate technical high schools those which boast of complete manual-training departments, but whose courses still are dminated by the universities and the colleges. Very few, even of the schools terming themselves technical high schools, have been able to divorce themselves from a curriculum which has for its fundamentals those studies usually prescribed in the literary schools and which devote less than 25 per cent of the time to handwork. A glance at the course of study of the manual-training high schools shows a course including English, mathematics, a language (either classical or modern), some history and science, plus shopwork and drawing unrelated to the rest of the course. In most of these schools even technical subjects have very little interdependence one with the other. Such schools should not be included under the head of separate technical high schools. Those of the above type being then eliminated, the schools that could be included would be only those which have a course of study where English, mathematics, science, shopwork, and drawing are the fundamentals and where the foreign languages and history play less important parts. Of schools of this nature there are comparatively few in the United States. Among the best examples are the related schools in San Francisco, namely, the California School of Mechanical Arts and the Wilmerding School of Industrial Arts for Boys. Another school of this nature is the Technical High School of Cleveland. Certain courses in the Technical High School in Chicago and the Stuyvesant High School in New York would entitle these institutions also to representation.

In some of these courses the aim seems to have been not so much to meet college requirements as to fit boys and girls to go out into industrial life. In this connection the Williamson Free School of Trades, in Pennsylvania, might also be included, as the academic work of the school is at least of high-school grade and the technical courses are scarcely to be approached by those of any of the public technical high schools.

Without attempting to analyze what is included under the various headings, one would find that a comparison of the courses of study is not without interest.

SAMPLE COURSES OF STUDY

THE CALIFORNIA SCHOOL OF MECHANICAL ARTS

Synopsis of Preliminary Courses

FIRST YEAR

BOYS AND GIRLS

	No. Weeks	Periods per Week
English	40	5
Mathematics (algebra)	40	5
Science (physics)	40	5
History (ancient and mediaeval)	40	5
BOYS		
General woodwork, molding, and pattern-making	40	10
Free-hand and mechanical drawing	40	5
GIRLS		
Sewing	40	7½
Free-hand and mechanical drawing	40	5

SECOND YEAR

BOYS AND GIRLS

English	40	5
Mathematics (geometry)	40	5
Science (chemistry)	40	5
History (modern European and American)	40	2½
BOYS		
Forgework and molding	40	10
Free-hand and mechanical drawing	40	7½
Modeling or wood-carving	..	..
GIRLS		
Dressmaking and millinery	40	10
Free-hand and mechanical drawing	40	5
Modeling or wood-carving	..	..

THIRD YEAR

BOYS

Mathematics (logarithms and trigonometry)	10	5
Science (radiant energy)	10	5
Machine shop	20 to 40	10

GIRLS

	No. Weeks	Periods per Week
Science (radiant energy)	10	5
German (elective)	40	5
Cookery	40	10
Household art and science, chemistry of cooking	40	5
Modeling or wood-carving	..	..

The preliminary course serves as a foundation for the different trades and technical courses. This part of the curriculum is essentially the same as the course given in the so-called manual-training high schools. It is different for boys and girls as regards toolwork and domestic branches, but otherwise it is the same for all students, and is required of all. It divides its time about equally between academic and industrial branches.

The academic branches include English, mathematics, science, and history. One period of fifty minutes per day for two years is devoted to each of these subjects with the exception of history, which is given on alternate days.

Instruction in English includes word-study, grammar, and rhetoric, practice in written and oral expression, and a study of literature through English classics, covering the ground designated as Subject One of the requirements for admission to the University of California.

The mathematical instruction includes elementary algebra, plane and parts of solid and spherical geometry, and plane trigonometry.

The science work consists of elementary physics during the first year, and chemistry during the second year. Various courses in applied science are given throughout the third and fourth years.

TRADES AND TECHNICAL COURSES

The school has facilities for teaching the following trades and technical courses, from which each student is allowed to make a selection at the beginning of his third year.

1. Pattern-making
2. Forgework
3. Molding
4. Machine-shop practice
5. Machine drawing
6. Industrial chemistry
7. Industrial art
8. Domestic science
9. Dressmaking
10. Millinery
11. Preparatory for technical college course
12. Polytechnic course

Through these courses the school aims to give each student a thorough knowledge of technique of some one industrial pursuit, from which he may earn his living. It offers, however, something more than the mere equivalent of a workshop apprenticeship. Besides the broad and thorough training

afforded by the combined academic and industrial branches of the preliminary course, there is the additional advantage that the shop instruction throughout is based upon work that is selected, as far as possible, for the benefit of the student, and not for the profit of his employer.

STUYVESANT HIGH SCHOOL, NEW YORK CITY

INDUSTRIAL COURSE

The industrial course of study has been prepared for boys who wish to go directly from high school to employment in some trade or other remunerative occupation.

FIRST YEAR

	Periods
English	5
Algebra	5
Free-hand drawing	2
Mechanical drawing	4
Joinery and cabinet-making	10
Music	1
Physical training, including physiology and hygiene	2
	29

SECOND YEAR

English	3
Plane geometry	4
Chemistry	5
Free-hand drawing	2
Mechanical drawing	4
Wood-turning, pattern-making, and foundry	10
Physical training	2
	30

THIRD YEAR

English	3
Plane geometry and trigonometry	3
Physics	5
Modern history	3
Mechanical and architectural drawing	4
Forging and machine-shop practice	10
Physical training	2
	30

FOURTH YEAR

	Periods
English	3
Shop mathematics	3
American history and civics	4
Advanced chemistry or economics or industrial and commercial law or applied mechanics	..
Steam and electricity	4
Mechanical or architectural drawing	4
Special shop or laboratory practice in one of the following electives:	10
1. Building construction (carpentry, sanitation, including heating and ventilating, electrical wiring and installation).	
2. Advanced forging and tool-making.	
3. Advanced pattern-making and foundry practice.	
4. Advanced machine-shop practice.	
5. Industrial chemistry, lectures and laboratory practice.	
Physical training	2
	30

The above course of study has been planned especially for boys who wish to go directly from high school to positions in machine shops or other works, in building construction, in electric-light and power plants, in chemical departments of manufacturing or packing establishments, in commercial industries requiring technical knowledge and skill, or in the various departments of the city government.

CHICAGO TECHNICAL HIGH SCHOOLS

SPECIAL INDUSTRIAL COURSES

The first two years in all the courses will be devoted to preliminary work in the fundamentals, as shown in the following outline.

FIRST YEAR

	Weeks	Periods
English	40	5
Algebra	40	5
Physiology	10	5
Physiography or bookkeeping	30	6
Mechanical drawing	40	5
Woodwork	40	9
Free-hand drawing	40	1
Gymnasium	40	1

SECOND YEAR

English	40	5
Plane geometry	40	5
Elementary physics or free-hand drawing	40	6

	Weeks	Periods
Mechanical drawing	40	5
Blacksmithing	20	10
Foundry and pattern-making	20	10
Gymnasium	40	1

At the beginning of the third year pupils will be given an opportunity to elect one of the following courses to be pursued during the third and fourth years:

COURSE IN MECHANICAL CONSTRUCTION AND ENGINEERING PRINCIPLES

THIRD YEAR

	Weeks	Periods
English	40	3
Solid geometry	20	5
Advanced algebra	20	5
Advanced physics	40	6
Industrial history	40	2
Machine-shop practice	40	15
Machine and free-hand drawing	40	5
Gymnasium	40	1

FOURTH YEAR

English	40	3
American history or civil government	40	2
Trigonometry	20	5
Chemistry	40	6
Manufacturing	20	15
Mechanical engineering principles	20	20
Machine and free-hand drawing	40	5
Gymnasium	40	1

COURSE IN ELECTRICAL CONSTRUCTION AND ENGINEERING PRINCIPLES

THIRD YEAR

English	40	3
Solid geometry	20	5
Advanced algebra	20	5
Advanced physics	40	6
Industrial history	40	2
Machine-shop practice	20	15
Electrical construction	20	15
Machine and free-hand drawing	40	5
Gymnasium	40	1

FOURTH YEAR

	Weeks	Periods
English	40	3
American history and civil government	40	2
Trigonometry	20	5
Chemistry	40	6
Electrical construction	20	15
Electrical engineering principles	20	20
Machine and free-hand drawing	40	5
Gymnasium	40	1

COURSE IN MACHINE-SHOP PRACTICE

THIRD YEAR

English	40	3
Shop mathematics	40	5
Advanced physics	40	6
Industrial history	40	2
Machine-shop practice	40	15
Machine and free-hand drawing	40	5
Gymnasium	40	1

FOURTH YEAR

English	40	3
American history or civil government	40	2
Chemistry	40	6
Machine shop	40	20
Machine and free-hand drawing	40	5
Gymnasium	40	1

In the above outlines one thing is apparent, namely, the tendency to drop part of the academic work and to devote more and more time to some special technical branch as the pupil progresses from the second toward the fourth year in school.

THE CLEVELAND TECHNICAL HIGH SCHOOL

In response to a specific statement from the secretary of this organization a longer description of the Cleveland Technical High School is given as a good example of the general type of separate technical high schools.

Aims.—The Cleveland Technical High School has two immediate ends in view: (1) to prepare youth of both sexes for a definite vocation

and for efficient industrial citizenship; (2) to help men and women already engaged in a vocation to better their condition by increasing their technical knowledge and skill. To such as may desire to pursue their studies still further it also offers the opportunity to prepare for entrance to technical schools of college rank.

In most classes the nature of the studies and the purposes in view are so different as to demand a separation of the boys from the girls. There is therefore organized within the one building a boys' school and a girls' school.

Sessions.—The daily session consists of nine periods of forty-five minutes each, beginning at 8:00 A.M. and ending at 3:15 P.M. The schedule of technical and laboratory work is arranged in double periods. Ordinarily each student is expected to carry three academic and two technical or laboratory subjects. There is a thirty-minute period for lunch not included in the above schedule.

The school is in session the year round. The year is divided into four quarters of twelve weeks each, with one week between the quarters. By thus eliminating the long summer vacation a saving of an entire year in the usual high-school course is made possible. This is of great advantage to the student (over 500 attending last summer) who for any reason may wish to secure a maximum of education in a minimum of time. Those who do not wish to avail themselves of this advantage or whose physical condition does not permit of the strain of continuous study, still have the opportunity of devoting four full years or longer to their high-school course.

The plan of a continuous session broken up into short terms is also of advantage to the student who from any cause fails in some part of his work, since by these frequent opportunities for readjustment he is given a chance to "catch step" again and to go on with his work in a new class with comparatively little loss of time.

DESCRIPTION OF COURSES

The courses not described are not distinctive.

English.—In the teaching of English literature, the constant aim is to make clear the relation of literature to life. A development of the power of appreciation is sought. A sense of form can be developed much better by the study of good models, where the pupils see how a master-writer puts his material together, than by the learning of rules.

Such of the college requirements as lend themselves to this treatment are retained. Only those substitutions are made which meet with the approval of the prominent scientific schools. The supplementary reading includes much that is best in invention and discovery, manufacture and distribution, and the attendant industrial and labor problems.

Wherever practicable, the composition work is co-ordinated with the other departments of the school, thus interrelating and binding together the course of study. By these means it is believed the pupil will attain that power, ease, and accuracy in the use of the English tongue which is admittedly of such great practical value as a preparation for life.

Mathematics.—The course in pure mathematics includes the usual theoretical work, the study of principles involved, and a thorough drill in mental arithmetic and the control of number.

On the technical side the pupil articulates the mathematics with the work of the drafting-room, shop, domestic science, and domestic art. Teachers of technical subjects are in constant touch with the mathematics department, anticipating problems which will arise and reporting immediately to that department any weakness shown by a pupil in problem or principle. In the Senior year advanced college mathematics is available, but for those not going to college a course in applied mathematics, composed of shop problems and elementary mechanics and electricity, is open.

Science, physiography.—The first and second terms are spent in studying physiography and meteorology. The processes of physiography and the land forms which they produce are taken up. A laboratory and field acquaintance with the common rocks is acquired during these terms.

Study of industries.—The third term is spent in studying the industries of various regions in their relations to climatic and physiographic conditions. The localization of industries and the cause of such localization can be worked out in a large measure. The location and growth of cities and the causes which govern their location and growth are pointed out. In general, the course aims to give the student an acquaintance with the physical environment in so far as it governs the physical conditions under which he lives.

Excursions to factories and other points of interest in Cleveland and vicinity are made whenever deemed profitable in connection with the study of industrial geography, industrial history, and allied subjects.

Chemistry for boys.—This chemistry is given in two separate and distinct courses.

The elementary chemistry is taken in the second year and is required of all boys. Consideration is taken of the more important elements with practical application, as far as possible. Four recitations and demonstrations, with one double laboratory period, constitute a week's work.

The advanced chemistry is taken in the fourth year and is an elective. This course is made intensely practical and includes much elementary metallurgy. The nature, uses, and methods of manufacture of charcoal, coke, iron, and steel are considered. Gas producers and types of industrial furnaces are treated. Modern practical figures and analyses are quoted and used in the discussions and problems.

Physics.—A special text has been written by the department in which much more attention is given to practical shop problems, mechanics, heat, and electricity, and less of the theory of physics and a minimum of physics of accurate measurement involved.

Electrical construction.—An electrical construction laboratory for trade classes has been equipped and sixty students are engaged in this line. A recitation devoted to theory is held daily and twenty periods per week are given to practical construction problems.

Most of the teachers of technical subjects are men with trade experience who have acquired later the art of teaching. The employment for twelve months in the year makes it possible to secure the best of teachers in competition with the manufacturers.

Drawing.—During the first two years, mechanical drawing, in so far as it applies to the shopwork only, is required. Drawings are made of shop problems and individuality of solution in place of class exercise is strictly followed out.

This subject is taught as the language through which the student learns to give graphic expression to ideas which he is later to work out in material forms in shop and workrooms. It is the one medium through which the craftsmen are able to record, clarify, and perfect such ideas as may come to them.

Training is given in accurate work by means of exercises and problems especially designed to enable the student to read intelligently the drawings which he is to use later in his shop practice. These exercises not only bring into use the various instruments in the student's equipment, but also represent some definite object to be made later in his course in joinery, wood-turning, forging, or pattern-making.

In addition to carefully constructed working drawings, free-hand sketches and views are made for the purpose of giving clear mental conceptions of the object and to teach the appearance and relation of the different views to each other, as well as to show the proper position of each on the drawing plate.

Shopwork.—Since the fundamental principles underlying all of the arts are identical, during the first two years a more or less definitely prescribed outline of instruction must be laid down. The shopwork of these two years is therefore practically a general course in manual training. The use and care of the various tools and machines, the qualities of materials and the processes of their preparation and distribution, and facility in applying the fundamental principles of construction are the chief ends sought.

This work is intended to be educative and creative as well as technically constructive. From elements and principles taught in the mechanical drawing and shop classes each pupil makes his own designs, which, when approved by the instructors concerned, he executes from working drawings. Within due limitations as to practicability and suitability of form and material, free scope is given to his inventive talent in the making of his design; but this once decided upon, he is held to strict accuracy and workmanship in its execution.

The course prescribed for the first two years is: turning, first quarter (I D); cabinet making, second and third quarters (II and III D); pattern-making and foundry practice, first quarter of second year (I C); forging, second and third quarters, second year (II and III C).

One quarter is also required in machine-shop practice at the beginning of the third year (I B). If at the end of this time peculiar adaptability in any given direction becomes evident to pupil, parent, or teacher, specialization along this line will be permitted in order that upon graduation a pupil may be better fitted for his life-work. The choice of vocation is forced upon a majority of our youth at an early age, and if a proper choice can then be made it is a great advantage.

Twenty-four periods per week are available for trade instruction in the third and fourth years.

DISTINCTIVE COURSES FOR GIRLS

The course in sex physiology.—Inasmuch as the study of the processes of life and training in observation can best be begun with a consideration of lower forms, the girls are segregated and stress is laid upon hygiene

and physiology for women. Special attention is paid to laboratory work and demonstration.

Chemistry for girls.—This course is directly correlated with domestic science and its aim is to give such experiments as will be of practical value to the girls after finishing school.

The applied work comprises the study of combustion, carbohydrates, fats, and proteins in many different phases, the manufacture of foods, the detection of the food principles in foods, such as starch in cereals, sugar in milk, etc.; the detection of adulterants, and some simple analyses, such as milk, eggs, etc.

Domestic art.—The aim here is to give such training as will enable girls as they grow to womanhood to appreciate the practical, economic, and artistic value of various materials in their application to dress and home furnishings.

The course includes plain sewing, the making of outfits for use in the departments of domestic science and domestic art, undergarments, shirtwaist suits, simple summer dresses, and millinery. Principles of handwork in the way of rolled edges, setting-in of lace, hand-run tucks, and elementary embroidery are introduced and applied to underwear. Original designs made by the pupils are used for this work and in the decoration of the table linen for the dining-room of the domestic-science department.

Millinery.—A course in spring and fall millinery is provided for girls who have learned some of the fundamental principles of sewing. Millinery affords the girls a broad expression of individuality and aims to create an appreciation of artistic color combinations and appropriateness.

The subject is closely connected with the courses in dress-making and applied art and consists in talks on materials used in millinery, wiring hats, making buckram and straw hats, wire frames, facings, building bows and covering frames, renovation of old material, and trimming hats. Attention is given to economy, simplicity, suitability, and the cultivation of artistic taste in all lines of work.

Domestic science.—The purpose of the work in this department is threefold: (1) to teach all subjects pertaining to the care and duties of a home, that girls may be prepared for practical home-keeping; (2) to teach all the theory relating to the above subject as applied science, that girls may acquire intellectual development as well as practical skill; (3) to teach institutional cookery and kitchen management as trade subjects, that students may be prepared for catering as a vocation.

Applied arts.—As mechanical drawing is made the medium of expression in the shop, so is free-hand drawing in this department. Nature forms are studied and sketched in the flat, in detail, and in color. From these studies pupils derive conventionalized units which by repetition and grouping furnish motives for original ornamental designs and for suggestions of form, proportions, and color harmonies. These they apply directly in constructive work, as in borders for garments, draperies, naperies, and in embroideries, in the decoration of pottery and leather-work; and in the designing, decorating, and making of utensils and articles of household and personal use from various materials and fabrics. The work, therefore, correlates in very definite and practical ways with dressmaking, millinery, domestic science, and the mechanic arts and crafts, and with the many occasions in daily life which an intelligent appreciation of fitness and beauty adds greatly to vocational success or personal happiness.

Costume design.—For girls taking sewing in the first and second years the design and free-hand drawing is all applied work. Underwear, shirtwaists, skirts, dresses, and hats are designed and the article actually worked out from the design.

Correlation.—Domestic-science subjects are often given as themes in the English classes. See also the courses of domestic and applied arts for ways in which these are correlated with domestic science. In short, all technical subjects involving home-making are taken as the basis of the elementary courses for girls, and around these the rest of the studies are grouped.

EVENING SESSIONS

One of the most important missions which this school can fulfil is the betterment of people already engaged in a given vocation. The abolition of the apprenticeship system in the subdivision of manufacturing processes has made it practically impossible for mechanics to secure any general training which will increase their efficiency and consequently their earning power in their present position or enable them to fit themselves for a better position. There is a need among the semi-skillled working classes of an opportunity for industrial education, and to meet this need the Cleveland Technical High School offers trade courses during the evening to men and women already employed during the day.

The evening sessions are from 7:15 to 9:15 P.M. The classes are divided into two sections, one meeting Monday and Thursday evenings and the other meeting Tuesday and Friday evenings.

The entire equipment used for instruction in the day school is available for the evening classes. Instruction is offered to men in carpentry, cabinet making, pattern-making, foundry practice, tool-forging, sheet-metal work, machine-shop practice, and electrical construction. Allied with these subjects is instruction offered in trade mathematics, English, applied mechanical drawing, including architectural sheet metal and machine drawing. Complete courses in plain and hand sewing, machine sewing, spring and fall millinery, and the applied arts are available to women. Plain cooking and whatever allied courses may be called for by a sufficient number are also within the scope of the night school. Free-hand drawing, charcoal and water-color rendering, clay-modeling, book-binding, leather-work, art metal-work and design as applied to the crafts are also offered.

The present enrollment is 1,517 day-school students. There are also 450 night-school students with over ninety on the waiting list for the machinery trade classes.

INTERPRETATION OF THE TECHNICAL HIGH SCHOOL

In the public technical high schools we seem mainly to have undertaken instruction in the machinery trades, namely, pattern-making and foundry practice, forging, machine-shop practice, mechanical and architectural drawing, and industrial art. The building trades seem to have been neglected. On the other hand, in the Williamson and Wilmerding schools, great prominence has been given to these most worthy lines of instruction.

Further inspection of courses shows that an effort is being made to condense into the first two years the handwork formerly given in the manual-training high schools in four, and to devote the last two years to specialization in some one technical line. The average age of pupils entering high school is fourteen and one-half years. They are then too young to select, or are unprepared through lack of grammar-school training, to receive trade instruction. From this point of view, the two years given to manual training, which seeks to place in the student's hands as much of general industrial aptitude as possible, is well spent and makes a rational choice of trade work at a later date far more probable. It further leaves open to the student the possibility of preparing for a technical college. One of the complaints made against the technical high school has been that it is failing in its purpose of supplying the industrial unit for work at the trade and is inspiring boys to seek an

engineering education. Doubtless this provision in the course of study is wise to just that extent. The technical high school cannot and never should hope to supply the trade with its workmen, but should fit boys to enter industrial callings and at the same time should include technical college preparation.

Separate technical grammar grades.—The limited available statistics show that the graduates of technical high schools very generally follow out their lines of training and to advantage. However, there is great need in a manufacturing country for the proper training of those who are to work at the trades, particularly where the highest skill is required as in the machinery trades. This is not the function of the technical high school. In the city of Cleveland—and this is true of nearly every large manufacturing center—fifty-two out of every one hundred girls and boys who enter the first grade of the public schools never get above the fifth grade. A differentiation in the courses of study in the grammar grades is as inevitable as the differentiation that has taken place creating the separate technical high school, and is more to be desired. Most of our population is predestined by birth and environment to enter the ranks of the workers and is entitled to recognition in the preparation open to it for that work. So the separate technical grammar grades are as essential as the separate technical high schools. These grammar grades, so set aside, should have the two-fold function of preparing the boys and girls for workmanship or for further technical education. In the same way the technical high school should fit for foremanship or for the technical college. It is not so much a question of the best education as it is of some education or none. To illustrate this point by a parallel, in Cleveland there were in 1905 six public district high schools with a total attendance of about 4,800. Cleveland was growing at the rate of 18,000 per year, yet there was a growth in the high schools in 1906–7–8 of only six, though the city increased by 54,000 in population. Since then, that is, in a period of equal length, 1909–10–11, the high-school attendance of this city has increased to 7,300, or 52 per cent. This, then, is simply a case of no education in 1906–7–8 for 2,500 children balanced against vocational education for 2,100 in 1911, plus a stimulation in the attendance of over 300 pupils in the academic high schools. It is not then a question of the desirability of the separate technical high school but a question of getting the boy to attend school or allowing him to go uneducated.

If these results can be accomplished for the comparatively small number who finish the eighth grade, the results to be obtained on a basis of the same percentage by the separate technical grammar grade would affect far greater numbers. With the technical grammar grade the opportunities for highly specialized trade work in the separate technical high school will be increasingly greater and the desirability of all forms of education more and more apparent to the public. To a large percentage of the working people, education, as now conducted, seems useless beyond the fifth grade, or it is to be obtained at too great a sacrifice. A change, then, in our whole system is inevitable if we are to check our "growing illiteracy." (This is a quotation from one of the officers of the National Census Bureau.) The separate technical high school is not now able to render its maximum of usefulness to the community for the reason that the pupils entering its courses are not especially adapted to its work through the proper elementary preparation and come to the school largely by chance. Trade instruction also has to be delayed on this account.

In the organization of the separate grammar grade, however, a choice of types of education beyond that point (i.e. in the high school) must not be made impossible. That is, a change of plan must still be available and a boy from the technical grammar grade should not be hampered in his choice of a high school any more than at present. His training should be such that he could enter either an academic, a technical, or a commercial high school with little loss due to preparation.

Looking again at the curriculum of the technical high schools we see that they embrace English and mathematics in common with the academic schools. Science seems also to be a requirement of the former, though frequently an elective in the latter. The substitution of handwork for a language other than English and a curtailment of the time given to purely academic subjects in the third and fourth year, together with an increase of time devoted to specialization in technical or shop branches, seem to be the main points of difference.

To many pupils, in fact to probably 75 per cent of those who enter the technical high schools, the opportunity to get further education is not possible, due largely to the lack of financial means. These schools must then be the finishing school for most of the boys and girls and to this end the trade instruction is useful. In the New York and Baltimore schools the opportunity to do engineering work of an elementary nature

is a particularly attractive feature. In the Stuyvesant School the equipment, by its very elaborateness, readily lends itself to this end. In fact, there are some colleges which cannot boast of so fine an equipment in their mechanical laboratories as is here available. This is true with regard to both mechanical appliances and electrical machinery. At the Crane School in Chicago the Electrical Construction Laboratory is equally elaborate, though it is reported that the equipment is of greater service to night- than to day-school pupils. In the Cleveland School the effort seems to have been in the direction of trades rather than in that of engineering lines. The field so uniquely held by the Stuyvesant School is certainly one in which other high schools could be of great service. Students wishing to enter the engineering field but to whom the colleges are not a possibility might prolong their courses two years and make the separate technical high school truly "the poor man's college." This opportunity should be made a possibility by extension of the function of our high school.

Training for technical teachers needed.—It rarely happens that manufacturers can find foremen or shop superintendents who have suitable training for their positions, and in many instances our best men are foreign-trained. There are two reasons back of this: one is the inability of the manufacturers to offer the proper training to their men, and the other is the lack of proper schools. We cannot, therefore, draw our teachers from the shops and factories except in rare instances. One of the functions of the technical schools should be to train the men, who, with adequate additional shop experience, can in turn take the positions in the technical high schools, or who will be fitted to organize the work of the grammar grades. Technical schools are now suffering as much from a lack of trained men for the teaching staff as from all other causes. Chicago seems to be the only city that has made an effort in a public way looking toward supplying the necessary teachers. In the normal courses of that city, work as now planned will fit teachers for these branches of the profession. But in a country where manual-training schools are growing up everywhere and where technical schools are filled to their capacity before the buildings are even completed, the meager supply is inadequate, to say the least. We must have normal technical training.

Summary.—In recapitulation, then, these points should be noted. (*a*) Proper training must be available in grammar grades: first, for the

trades; second, for the academic school; and third, for the separate technical high school.

(*b*) Proper training must be available in the separate technical high school for: first, the trade foremanship; second, for high-school engineering courses and technical normal courses; and third, for technical colleges.

These are to be some of the developments in the larger cities in public secondary education in the immediate future.

IV*B*. INDUSTRIAL TRAINING IN THE COSMOPOLITAN HIGH SCHOOL

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A cosmopolitan high school may be defined, from the vocational standpoint, as a high school which provides various kinds of vocational education. In such a school are combined the advantages which some communities seek to provide by establishing special types of high schools. Such a school offers many courses and trains for many vocations in one plant and under one management. Ideally, such a school will provide equal or proportional representation of all types of vocations which the children of a given community may wish to pursue.

By direction of the Secretary of this society, the writer characterizes briefly the cosmopolitan high school under his own supervision. With the opening of school in 1911, the high school at Decatur, Ill., moved into a new plant which had been under erection during the preceding years. The building was conceived and built for the purpose of accommodating a cosmopolitan high school enrolling about 1,000 students.

By the time the building was completed the faculty had developed a tentative organization of the lines of work and opportunities to be opened to students. The course provides ten groups of study; each group possesses a core or backbone of required work extending over four years. Certain elective privileges are extended in the elective and optional studies provided in each study group. The course of study which this organization displaced provided strong liberal-arts advantages and in addition a little bookkeeping, cooking, sewing, and manual training. In the present organization, the former work in the liberal arts is broadened and extended and organized into six groups of study—foreign language, English, mathematics, science, history and civics, art—each group taking its label from the lines of work constituting its core or backbone. Vocationally these groups of study are intended to equip students for further study in normal schools, colleges, universities, art schools, and schools of technology. The bookkeeping

has been displaced by lines of work affording extensive business and commercial advantages and fitting for business pursuits, office and clerical work, and for higher study in related lines. Likewise, extensive courses have been provided in the household arts in place of the limited work in cooking and sewing and in the mechanic arts in place of the work previously provided in manual training. The household-arts courses are primarily intended to fit girls for home management. At the same time they will afford large returns to those who wish to go into such trades as millinery or dressmaking, or into teaching, or to pursue advanced study in this field. The mechanic-arts course should render valuable service to those fitting for the trades and industrial work and for advanced study in schools of engineering and technology. The tenth group of study is the normal preparatory group, designed to promote the training, development, and guidance of those students who wish to teach in the public schools.

The foregoing discussion of the organization of the high-school course of study is purposely stated from the vocational standpoint, both because this is the key to its adequate interpretation and because of the standpoint assumed above in defining the cosmopolitan high school. While the preceding discussion analyzes this course of study from the point of view of vocational attainment, the other values it provides, such as discipline, culture, appreciation, and vocational discovery, are definitely sought in its administration.

The term industrial training, or education, has been and is used with various significations and contents. In his *Education for Efficiency* (p. 38), Dean Davenport employs it to include training for agriculture, the mechanic arts, household affairs, and the industries connected with manufacturing. The Committee of Ten of the National Society for the Promotion of Industrial Education (*Report*, p. 71) included in industrial education the trades and agriculture. *Bulletin No. 12* of the National Society defines (p. 19) industrial education in such a way as to distinguish it from other forms of vocational education by saying its "purpose is to fit for a trade, craft, or special division of manufacturing work." Thoughtful speakers and writers have generally accepted the content ascribed to this term in *Bulletin No. 12*, and it was evidently the intention of those who organized this *Yearbook* that it should be so defined. The term is so used in the following discussion.

The problem of the public schools in providing industrial training

is essentially one of producing skilled labor. The school must seek to render efficient and intelligent all those who are to serve society through participation in the industries. It should proceed in the solution of this problem, however, consciously guided by the fact that skilled labor is of two widely different kinds—that which depends mainly on *habit* and that which depends mainly upon *initiative*. Between the extremes of these types of labor we find a large variety of ability with various combinations of habitual action and initiative, of course.

The equipment of these two types of skilled labor is very different. The first type requires that a man shall be so drilled in the handling of particular materials in a particular way that his procedure is always the same. All of his actions are automatic responses emanating from definite, well-established habits. The second type of laborer, on the other hand, will find, as Superintendent Brooks, of Boston, shows (*Report* for 1909, p. 35), that "the overemphasizing of habit will prove a hindrance to mobility of thought and readiness in action when confronted with conditions demanding the use of judgment." His need is not so much the ability to perform a given set of operations upon particular materials with great speed and a high degree of accuracy. Rather, his equipment consists in a knowledge of machinery, materials, and processes, and of ways and means of employing the same, with the labor available, to secure different and improved products. He must be strong in his mastery of facts and principles, in his ability to concentrate as he reasons on the plans his creative imagination evolves, in his power to draw safe, practical conclusions from the data under consideration in an actual industrial situation, and in the successful execution of plans and policies determined upon. Habit formation enters largely into the development of the laborer who is to exercise initiative mainly, but the habits formed are those which have a wide, general use. It is evident also that the ideals and tastes of the second type of laborer are quite as important as his habits.

No public high school which I have been able to study attempts to provide industrial training for the first type of laborer. The tasks he will be called upon to perform are so subdivided under modern industrial conditions that the school does not need to attempt the development of the particular skill required in such laborers. A very few days' experience in any factory will do for these laborers all that education could ever do in the development of mere skill. The school

City and School	Purpose, Aim, and Plans of School	Work Offered and Other Evidences That Industrial Training is Intended
1. Chicago: all high schools offer two years of work, advanced and intensive work in Lane Technical, Crane Technical, and Lake high schools.	Of the 11 courses announced, three definitely seek to provide industrial training: *a*) The manual-training course "is to prepare students for the technical industries." *b*) The builders' course "is to prepare students for the building industries." *c*) The household-arts course is "to prepare for . . . . the textile trades."	Courses in printing, proofreading, woodworking, mechanical drawing, foundry, forge, pattern-making, machine-shop practice, machine and architectural drawing, electrical or gas engine construction, bricklaying, masonry, metalwork, electrical wiring, making estimates. Work in mathematics, physiography, history, sanitation, physics, chemistry, biology taught from industrial standpoint, also attention to contracts, specifications, ordinances.
2. Cincinnati: all high schools.	Of the 9 courses announced, the technical co-operative courses for both boys and girls are definitely planned to provide industrial training. During the first two years, boys take technical laboratory work and drawing given in the manual-training course. By close of second year boys "decide what shops or trades they desire to enter." "No trade is taught in school." Co-operation in millinery and dressmaking trades only have been arranged for girls.	Courses announced are manual training, turning, cabinet and pattern making, foundry, forge, machine-shop science and practice, sewing, millinery, dressmaking, tailoring, art needlework. "Mechanical drawing . . . . and the work in mathematics, English, and physics is so chosen that the relation between the different subjects and the shopwork is emphasized."
3. Cleveland: the technical high school.	The two ends in view are: (1) "to prepare youths of both sexes for a definite vocation and for efficient industrial citizenship; (2) to help men and women already employed to better their vocation by increasing their technical knowledge and skill." Opportunity is afforded also to prepare for entrance to technical schools. Two years of general work are required of all; in the	The courses include printing, mechanical drawing, turning and cabinet making, foundry practice, forging, machine shop, machine sewing, dressmaking, millinery. The content of the other studies is determined by the aim of the school; e.g., the outside reading in English includes the "best in invention and discovery, manufacture and distribution, and the attendant

City and School	Purpose, Aim, and Plans of School	Work Offered and Other Evidences That Industrial Training is Intended
	last two years specialization in the direction of a vocation is expected.	industrial and labor problems; the mathematics work articulates with the work of the drafting-room, shop, domestic science, domestic art; geography emphasizes industries of various regions; chemistry is related to cooking for girls, and to nature, uses, and methods of manufacturing charcoal, coke, iron, steel."
4. Indianapolis: the manual-training high school.	Specific data were not receive school told me in a conferen dustrial courses are concern in the Cleveland Technical	d, but the principal of the ce that their work so far as in- ed is exactly like that provided High School.
5. Kansas City: the manual-training high school	It is not the aim to produce mechanics any more than any other class of specialists. No special trade is taught, but the aim is to give the pupil that kind of skill and constructive ability which will enable him to take up any trade.	Courses providing work resulting in industrial training are sewing, dressmaking, millinery, joinery, turning, molding, pattern-making, forging, machine toolwork. The data supplied do not indicate that work in other subjects is given an industrial bias.
6. Los Angeles: the polytechnic, mechanic-arts and manual-arts high school.	The polytechnic is the technical high school of the city. Its courses are highly specialized. The mechanic-arts high school provides advantages falling between those in the classical and technical high schools. The industrial work is presented from the educational and developmental standpoints. The manual-arts high school provides the work usually offered in a manual-training high school. Its aim in relation to industries is to bring a closer relationship between industrial pursuits and educational advantages. Each of these special high schools is really cosmopolitan in character.	Courses are provided in woodworking, forge, machine shop, machine sketching, mechanical drawing, foundry, pattern making, sewing, dressmaking, millinery, printing. Nine groups of study are provided in the polytechnic high school leading to expert ability in electrical engineering, drafting, pattern-making, forging, cabinet-making, foundry work, machine work, dressmaking, millinery. All other lines of work are presented with special reference to the technical aim of this school. The courses in the other schools are similar but fewer in number and are less highly specialized vocationally.

City and Schools	Purpose, Aim, and Plans of School	Work Offered and Other Evidences That Industrial Training is Intended
7. Louisville: Du Pont manual-training high school.	By terms fixed by donor, "no special trade shall be taught in said school." The work is "not primarily industrial but educational."	Work provided in drawing, wood-turning, joinery, pattern-making, forge, foundry, machine shop.
8. Newton, Mass.: the technical high school.	The aim of the extra technical course is to prepare "for work in the productive industries."	Courses are offered in mechanical drawing, cabinet making, wood-turning, machine and vise work, forging, pattern-making, molding, machine shop, electricity, tool-making, dressmaking, millinery, laundering, catering. All subjects in this course are taught from the industrial standpoint.
9. Springfield, Mass.: the technical high school.	The aim is to "combine and correlate practical training with a full course of academic studies." "No attempt is made to teach either the mechanical or building trades." "Aim in all departments . . . . is educational, broad and practical—not narrowly vocational."	Courses are provided in weaving, sewing, pattern drafting, shirt-making, dressmaking, millinery, wood-turning, joinery, metal-work, lathework, pattern-making, forging, machine-shop work, tool- and machine-making. Same plant and equipment is used for evening school of trades.
10. St. Louis: all high schools.	The course in manual training has an industrial bearing, "but it is not the purpose of the course to teach any trade but the work embodies the principles underlying all trades." The aim of the work is educational. "By giving special attention to some one of the occupations taught in the high-schools, workmanlike skill and speed in its practice may be acquired."	Courses provided are such as are common in manual-training schools, joinery, carving, turning, molding, pattern-making, foundry, forging, machine-shop work, sewing, cutting, fitting, garment-making, millinery, laundering.
11. St. Paul: all high schools.	Courses of study are not in pr each of the four new cosmo of industrial work is provid including carpentry, wood ing, machine, forge, and	int for distribution yet but in politan high schools four years ed, the superintendent writes, turning, joinery, cabinet mak- foundry work.

may do much, to be sure, in rendering these laborers industrially intelligent, but the training essential in securing this end is largely of the type which emphasizes the development of initiative rather than habitual action.

The controlling aims and the lines of work employed in a number of widely separated, representative general or cosmopolitan public high schools, that seek to provide industrial training which should function in the development of industrial workers of the second type and of many of the grades of labor falling between the extreme types, are briefly indicated on pp. 71–73. The data was secured from printed bulletins mainly, although it was necessary to supplement this in some cases by correspondence. It is evident that schools providing strong work in industrial education have been omitted. The list of schools investigated was made up from the writer's personal knowledge and from information received from the Secretary of this society, the Secretary of the National Education Association, the office of the Commissioner of Education for Massachusetts, and the Bureau of Education at Washington.

How wide the gap is between the statement of a school's purpose and the concrete realization of the results it promises, I am unable to determine. The belief seems fairly justified, at least, that a few schools are making a definite beginning through the co-operative plan of work or otherwise, in the provision of training in printing, carpentry, bricklaying, masonry, painting, plumbing, and in the development of the basis for a high type of appreciation and initiative in whatever phase of industrial work the student may go. In view of the results secured in evening classes with a given plant, equipment, and faculty, there seems no insurmountable reason for not securing correspondingly satisfactory results in industrial training with the regular students of the same high school.

V. THE PUBLIC TRADE SCHOOL

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In these days when the entire public instructional system of the United States is being scrutinized from within and without in the endeavor to reply to the question, "Just what do you do to prepare for vocational efficiency?" those who are actively engaged in the problem of specific vocational preparation are not exempt. Such efforts on the part of the public-school system to send out graduates trained for a definite vocation are new with the exception of higher institutions which have for years prepared students for professional lives and some high schools which instituted commercial courses including shorthand and typewriting.

Two basic questions propounded to the trade school are: Can a boy serve a successful apprenticeship in a trade school? If so, what does it cost the taxpayer? These seem to be the main questions. Those who are interested in educational work have many more questions in detail to ask.

On January 2, 1912, the Milwaukee Public School of Trades for Boys was six years of age. A brief outline of its history, organization, and results obtained during that time follows: On the evening of February 2, 1904, Mr. Frederick W. Sivyer, president of the Northwestern Malleable Iron Company of Milwaukee made his inaugural address as president of the Merchants and Manufacturers' Association of that city. Among the matters recommended to be considered by the association during his term of office was the need of industrial education for the youth of the community. His suggestion met with an immediate and hearty response. A committee was appointed to gather data regarding trade schools here and abroad. Loyal support was pledged to the movement. On January 2, 1906, the school was formally opened to sixty young men eager to become skilled workmen. At first instruction in but two trades was given, namely, pattern-making and plumbing in the day and night classes. In September of the same year the machinist trade was added to the curriculum.

Early in the year 1907, a problem, which gradually had been growing more and more serious, had to be fairly met and solved. It was a question of finances. To charge students the cost of their tuition in a properly conducted trade school means to debar the very ones who need the instruction. Equally impractical is it to expect a few to bear the expense of a work so valuable to the entire community. The need of such a school was proven the first day it opened its doors. From its outset it was making better workmen and better citizens. It was the opportunity and privilege of the Merchants and Manufacturers' Association to start such a work in the life of a city, but it was not its bounden duty to continue it. The child grew beyond the power of its parent to support it. Since the work brought a rich harvest to the municipality, the municipality should bear the expense of the sowing. The solution of the problem lay in having the trade school included in the public-school system of the city. To do this, a tax, additional to the one already levied for the public schools, was necessary. This extra assessment could be collected only by the permission of the state legislature. Consequently, a bill was prepared and presented to that body early in 1907. It met with immediate indorsement in both Assembly and Senate. It passed and became effective July 1, 1907.

The Milwaukee Board of School Directors immediately seized its opportunity to take over a trade school well equipped to teach three trades and with one and one-half years' experience in pioneer work. On account of this progressive step on the part of the public-school authorities the original subscribers deeded the entire equipment of the school to the city in fee simple.

The passage of the act made two vitally necessary things possible, namely, a longer and more thorough course and free tuition. More floor space was rented and preparations made to include another trade in the curriculum, namely, a thorough course in woodworking. Instruction in this department began July 1, 1908.

On December 31, 1909, fire destroyed the main building, crippling the departments of machine, pattern-making, and woodworking. Fortunately, the entire loss was covered by insurance. Near-by temporary quarters were rented at once.

During the year 1911 the Board of School Directors authorized the erection of a Municipal Trade School. The building which is being erected is to cost without equipment approximately $210,000.00. The

site, 300×150 feet, which was obtained by condemnation proceedings, cost $42,500.00. It is expected two wings of 50×100 feet, and three stories high each, and the power plant will be ready for occupancy by September, 1912. Upon the completion of the new plant it is planned to include several new trades. This, briefly, is the history of the Milwaukee Public School of Trades for Boys.

It will be of interest to note that on December 1, 1909, the Board of School Directors established a Public School of Trades for Girls, which admitted girls at fourteen years of age. This school, which has a capacity for two hundred forty-five girls in day and night classes, respectively, is at present so popular that a waiting-list has become compulsory in all its sessions. It is expected by September, 1912, to be able to accommodate three hundred seventy-five pupils in day and night classes, respectively.

Before touching upon the results accomplished in the six years of its existence, a brief outline of the present organization of the boys' trade school may be of interest. The school is under the immediate supervision of an Advisory Committee of the Board of School Directors, as provided by legislative act. The school is maintained by the assessment of a special tax, not exceeding three-tenths mill, for the purpose of industrial education.

The trades taught are two manufacturing: machinist and tool-making, and pattern-making; and two building trades: woodworking, and plumbing and gas-fitting. The total capacity of the school is one hundred fifteen students in day and night classes, respectively, subdivided as follows: pattern-making, woodworking, and plumbing, twenty-five each, machinist and tool-making, forty. The length of each course is measured by the problems which must be mastered rather than by a specified amount of time. Approximately two years of fifty weeks per year and forty-four hours per week—allowing seven legal holidays per year—making the total time approximately four thousand, two hundred eighty-eight hours is the time usually required by the first three above-mentioned trades. The plumbing and gas-fitting trade requires less time. It is the aim of the school to place the student in conditions as nearly as possible like those he will meet in actual practice. School hours are from 8:00 A.M. to 12:00 M., and from 1:00 P.M. to 5:00 P.M. daily except Saturday; Saturday sessions 8:00 A.M. to 12:00 M.; evening classes 7:30 to 9:30 P.M. on Monday, Tuesday, Thursday, and Friday nights of each week from October 1 to April 30.

The course of instruction in each trade includes the following five branches:

1. Shop Practice and Trade Lectures
2. Drawing..... { Mechanical Drawing { Isometric, Working Drawings, Problems in Design, Architectural; Free-hand Working Drawing }
3. Workshop Mathematics... { Shop Arithmetic, Shop Algebra, Shop Geometry, Shop Trigonometry }
4. Shop Inspection Trips..... { In connection with each trip a carefully written report must be submitted }
5. Practical talks and lectures on subjects connected with each trade, and topics fundamental to all trades.

Approximately one-fourth of the student's time during his course is devoted to mechanical drawing and to the academic instruction incidental to his trade and vitally essential to the first-class artisan whom the world needs and the school is endeavoring to develop; the remaining three-fourths being spent in actual shop practice.

A special feature of all the classroom work consists in adapting it as nearly as possible to the special requirements of the various trades. For instance, a different class of instruction is given in mechanical drawing and workshop mathematics for each trade.

A good working knowledge of elementary mathematics is highly essential to the successful mechanic and foreman, and a good course in this subject is given. While it is conceded that many other branches would prove of value to the students, it has not been deemed advisable to introduce them into the actual work of the school, but the students are urged to supplement their practical work by as much outside reading and study as possible. Home work is required of all students. They are urged to subscribe for some good trade journal along the lines of their chosen trade and keep in close touch with the latest and best methods of trade practice. It is also urged upon them to start a library of their own. The world today has excellent facilities for self-culture for the ambitious and industrious youth. Wisconsin offers the oppor-

tunities of university extension work. The advantages to be obtained by continuation work in the city night schools of both grammar and high-school grade are carefully impressed upon the graduate of this school.

It is not the purpose of the school that its graduates shall be merely skilled artisans; it is intended that they shall not only be trained and efficient, but intelligent workmen, desirous of making the most out of themselves in their chosen vocation from its every point of view.

Each student receives personal attention and instruction and no student is held back on account of the slowness of other pupils. Careful attention is paid to the formation of neat habits of work in each student, and only the best methods of procedure are taught. All work is done from drawings and no problem, either in classroom or shop, that does not have a practical application is given to a pupil. Theory and practice are closely related all through each apprenticeship. It is the purpose of the school to surround the students by the best environment and atmosphere. Habits of punctuality are encouraged and the value of the possession of a good trade impressed upon the students. The use of tobacco is not allowed on the premises.

It is also the aim of the school to secure instructors who are specialists in their line, men who are interested in the work and who can impart their knowledge and experience to apprentices.

The class of work given to the students is carefully planned to be as nearly as possible of equal educational and practical value. Thus the student's interest is aroused and held. A high standard of workmanship is demanded from every student and only those attaining it are permitted to graduate.

The night classes are planned principally to supplement the experience of apprentices and journeymen who are employed during the day at the trade in which they desire advancement under night instruction. The total day instruction of the two-year courses requires four thousand, two hundred eighty-eight hours. The total night instruction of one term of thirty-one weeks at eight hours per week amounts to two hundred forty-eight hours. Thus it is evident that none but students of exceptional ability and determination could expect to serve the entire school apprenticeship in night classes only. The school does not advise students to attempt to learn a trade by this means.

In order to qualify for admission, students must be sixteen years of

age and be able to read and write in English and perform the fundamental operations of arithmetic. Eighth-grade graduates are admitted without examination and are given preference over applicants who have not had such preparation. Since it is required by the Board of School Directors that a pupil be at least sixteen years of age in order to be admitted it is urged upon all boys desirous of entering that they take advantage of every opportunity offered by the public-school system up to the age when they are eligible for admission to this school.

Boys who have graduated from the eighth grade and who desire to attend the Trade School, but who are below the age at which they may enter, will be allowed to pursue in the high schools, until they reach the trade-school age, those studies which will be of most help to them in their future work in this school.

The cost of maintaining this school is approximately two hundred and fifty dollars per year for each pupil. Thus in two years a boy receives an education costing from four hundred to five hundred dollars, and by means of it, the advantage of a start in life of inestimable value.

Tuition is free to boys who are residents of Milwaukee and between the ages of sixteen and twenty. They are required to pay $1.00 per month for materials. Residents over twenty are required to pay $5.00 per month, which includes material charges. Non-residents are required to pay $15.00 per month, which also includes material charges. Instruction is given in night classes four evenings per week from October 1 to April 30, two hours each evening, with charges as follows: Residents between sixteen and twenty, tuition free and fifty cents per month for material charge; residents over twenty, $1.00 per month for tuition and materials; all non-residents, $4.00 per month for tuition and materials.

In complying with the request of the Wisconsin Legislative Committee on Industrial Education in the spring of this year for information regarding attendance and per capita cost and the number of graduates the following information was found. These figures include enrolment from January 2, 1906, to April 1, 1911.

TOTAL NUMBER PUPILS ENTERED

Trade	Day	Night
Pattern-making	89	105
Machinists	132	215
Plumbing	119	214
Woodworking	28	46
Cable splicing	17	...
Mechanical drawing	...	22
	385	602

AVERAGE LENGTH OF ATTENDANCE OF PUPILS

	Day	Night
Pattern-making	11.4 mos.	4.5 mos.
Machinists	7.7 mos.	4.6 mos.
Plumbing	3.4 mos.	3.7 mos.
Woodworking	9.3 mos.	4.7 mos.
Final average	8 mos.	4.4 mos.

CLASSIFICATION OF ATTENDANCE

Day Classes

24	pupils	or	7 %	remained	24	mos.
9	"	"	2½%	"	21	"
18	"	"	5 %	"	16	"
15	"	"	4 %	"	13	"
8	"	"	2¼%	"	12	"
5	"	"	1½%	"	11	"
12	"	"	3½%	"	10	"
15	"	"	4½%	"	9	"
16	"	"	4¾%	"	8	"
24	"	"	7 %	"	7	"
32	"	"	9¼%	"	6	"
19	"	"	5½%	"	5	"
35	"	"	10 %	"	4	"
22	"	"	6¼%	"	3	"
30	"	"	8½%	"	2	"
48	"	"	13½%	"	1	"
18	"	"	5 %	"	1	"
350			100%		less than 1 mo	
35*						
385						

Night Classes

1	pupil	or	.2%	remained	27	mos.
3	"	"	.5%	"	22	"
1	"	"	.2%	"	21	"
1	"	"	.2%	"	19	"
2	"	"	.3%	"	18	"
11	"	"	2. %	"	14	"
4	"	"	.7%	"	13	"
4	"	"	.7%	"	12	"
4	"	"	.7%	"	11	"
4	"	"	.7%	"	10	"
11	"	"	2.0%	"	9	"
13	"	"	2.0%	"	8	"
61	"	"	12.0%	"	7	"
64	"	"	12.4%	"	6	"
35	"	"	7.0%	"	5	"
51	"	"	10.0%	"	4	"
52	"	"	10.0%	"	3	"
64	"	"	12.4%	"	2	"
109	"	"	21.0%	"	1	"
26	"	"	5.0%	"	less than 1 mo.	
521			100%			
81*						
602						

* These students were enrolled during first six months of school. No data was made of their ages.

AVERAGE AGE OF PUPILS ON ENTERING

19 years in day classes
21 years in night classes

CLASSIFICATION OF AGE OF PUPILS ON ENTERING

Day Classes

129	students	or	37 %	enter	at	16 yrs.
67	"	"	19 %	"	"	17 "
42	"	"	14 %	"	"	18 "
30	"	"	9 %	"	"	19 "
24	"	"	6 %	"	"	20 "
15	"	"	3¾%	"	"	21 "
9	"	"	2½%	"	"	22 "
8	"	"	2¼%	"	"	23 "
3	"	"	¾%	"	"	24 "
2	"	"	½%	"	"	25 "
5	"	"	1¼%	"	"	26 "
2	"	"	½%	"	"	27 "
4	"	"	1 %	"	"	28 "
3	"	"	¾%	"	"	30 "
1	"	"	¼%	"	"	34 "
4	"	"	1 %	"	"	38 "
2	"	"	½%	"	"	42 "
350			100 %			
35*						
385						

Night Classes

60	students	or	11.5%	enter	at	16 yrs.
91	"	"	18.0%	"	"	17 "
93	"	"	18.5%	"	"	18 "
63	"	"	12.4%	"	"	19 "
38	"	"	7.4%	"	"	20 "
27	"	"	5.2%	"	"	21 "
28	"	"	5.3%	"	"	22 "
14	"	"	2.5%	"	"	23 "
11	"	"	2.0%	"	"	24 "
16	"	"	3.0%	"	"	25 "
15	"	"	3.0%	"	"	26 "
12	"	"	2.0%	"	"	27 "
8	"	"	1.0%	"	"	28 "
5	"	"	1.0%	"	"	29 "
12	"	"	2.0%	"	"	30 "
2	"	"	.3%	"	"	31 "
4	"	"	.7%	"	"	32 "
3	"	"	.6%	"	"	34 "
3	"	"	.6%	"	"	35 "
2	"	"	.2%	"	"	36 "
2	"	"	.4%	"	"	37 "
2	"	"	.4%	"	"	38 "
3	"	"	.6%	"	"	40 "
2	"	"	.4%	"	"	42 "
4	"	"	.8%	"	"	45 "
1	"	"	.2%	"	"	52 "
521			100 %			
81*						
602						

* These students were enrolled during first six months of school. No data was made of their ages.

NUMBER OF GRADUATES

Pattern-makers	12
Machinists	12
Plumbers	10
	34

AVERAGE WAGES BEING RECEIVED BY GRADUATES

(Having left school at an average of 11½ months)

Pattern-makers	31.8 cents per hour
Machinists	32.6 cents per hour
Plumbers	53.2 cents per hour
	117.6 cents
Average	39.0 cents per hour

The per capita cost is approximately $250.00 per year.

A brief discussion of above data may prove helpful to those considering the establishment of trade schools. The bald fact that out of three hundred eighty-five students, enrolled in day classes only, in five and one-fourth years but 7 per cent graduate is likely to be claimed as an irrefutable argument against trade schools by those antagonistic to such institutions in any form or location, or in the public-school system. To even state that the average length of time spent by all the day pupils is but eight months is likely to receive a none too hearty welcome. The cost of the help given all these young men can be computed to a cent but the value received by these three hundred eighty-five hungry lives in day classes and six hundred two in night classes is immeasurable.

The chief cause of disappointment to all educators is the fact that pupils do not stay longer in school and their greatest problem is to find ways and means to diminish the ebb flow. Aside from schools which prepare for the professions practically all schools are academic. The majority of the pupils in academic schools do not expect to use their specific training in their bread-earning work, but the attitude of the pupil who enters a school which trains for specific efficiency, coupled with the desire to be an earner, to be free and do with his earnings as he wishes, makes him shortsighted. This same question of discouragingly small harvests from a costly sowing is witnessed daily in other efforts to advance the efficiency and betterment of the community. The money spent by churches, the outlay for Young Men's and Young Women's Christian Associations, the money and effort advanced for the propaganda to stem the scourge of the white plague, the tireless labor expended for multitudinous philanthropic ends—none bring in the harvest which we fain would witness. It is not a question of becoming impatient, discouraged, or disgusted; it is a matter requiring thorough analysis, an

honest acceptance of what the analysis reveals, and a fearless and tireless effort to remedy the weak places and reinforce the strong ones.

The fact that the graduate of a trade school can make a better showing, both as to the quality and amount of his industrial intelligence and also his earning power, at the end of four years from entering school than the commercial apprentice graduate can in the same length of time from starting his apprenticeship, proves that the cause of short attendance is exterior to the school.

The comparative per capita cost between different schools depends upon the trades taught, the equipment for each trade, and the kind of courses offered and the number of pupils in each trade.

Analyzing all the trades in the world it is found that they come under one of two heads—building trades or manufacturing trades. Analyzing farther it is found that all the building trades are dependent upon the manufacturing trades and all the manufacturing trades are based upon four fundamental trades. These are, in logical order, the drafting, pattern-making, molding, and machinist trades. Several striking facts should be briefly noted regarding these four basic industries. They are all vitally united—they form a series of closely allied, correlated, and inseparable steps, and are the beginnings of things in all the world's industries. A baker is a manufacturer; with flour, water, yeast, and other ingredients, all mixed and baked according to a certain formula, he makes bread. From raw materials he gives us immediately a finished product. The manufacturer ofs team engines cannot put pig iron in his cupola, mix it with a certain per cent of scrap iron, melt all together and make the finished product of a steam engine by pouring the molten metal into a mold. First the design must be made, then the patterns prepared, castings must next be poured in the foundry, and the machine shop must finish and assemble the parts.

Another important point that must be noted, as bearing upon the cost of trade-school equipment is the rapidly increasing ratio of skilled workers needed in these four trades as the evolution of the steam engine progresses. It is very difficult to obtain absolute figures on this point, but probably a fair average is as follows: Five draftsmen will keep from fifteen to twenty-five pattern-makers busy, fifteen pattern-makers will keep fifty to seventy-five molders employed, and fifty molders will keep from one hundred fifty to two hundred machinists employed. Also to be considered is the fact that in approximately the same ratio the cost

of equipment of the four trades advances. Thus it is evident that first-class machinists are far more in demand than the artisans of any other manufacturing trade. Also it is evident that the equipment of the machine shop is the most costly. School-board directors in cities and municipalities must face this problem fairly and not evade it. A city can well afford to retrench along other lines in order to advance the cause of industrial education. The cost of installation for all the building trades is considerably less than that of the fundamental manufacturing industries. So the equipment of our trade schools should be of the best available tools and machinery. The right trade school should be, not only a source of education to the apprentice, but also to the manufacturer in many ways. The trade school should stand for the highest and best along every line.

Another problem to be met is how to dispose of the products of the school. The Milwaukee Board of School Directors, in endeavoring to solve this problem, passed the following resolution: "*Resolved*, That in accordance with chap. 122, secs. 926–27, Laws of 1907, State of Wisconsin, the products of the Milwaukee School of Trades may be sold in open market at prevailing market prices." When the average length of time of remaining in trade school is lengthened the quality of output of each student will be of higher and higher value, and the returns to the school correspondingly larger and the cost to the taxpayer smaller. In this school much of the output from some of the shops is used in the schools of the city.

The cost of the high-school student per year in Milwaukee is approximately $60.00, or $240.00 for his four-year course. The cost of the trade-school graduate is approximately twice this amount for two years, but the trade-school graduate is worth, on leaving school, between three and four times the amount of the high-school graduate who has not had special vocational training in his secondary-school work.

But there is another point from which the municipal trade school may be viewed—that of vocational inspiration. Perplexing as the problem of vocational training for the boy above sixteen years of age may prove to a city, much more difficult is the question to answer rightly what to do with the fourteen- to sixteen-year-old boy who wishes to leave school at fourteen or when completing the grammar-grade work. There are few questions more vital for each boy and girl to answer ere they reach maturity than what their choice of vocation

will be. By rights it should not be necessary for any youth to make such a choice so far-reaching in its results until a good grasp of its import is known to him. And yet in spite of the *individual* and *national* gravity of the matter there is no problem which enters the individual life of a large majority of our youth that is given less serious thought by them, by many parents, by employers, and by boards of education. Just as long as the law permits the departments of education of our country to release their hold on our youth at the age of fourteen just so long will the youth, the nation's greatest asset, be exploited in many ways and all to the loss of the individual exploited.

Between hesitation on the part of boards of education to provide vocational training on the one hand and compelling statistics from the public schools on the other, we are filling the blind-alley occupations with a pitiful supply of what by a merciful interference would make an efficient and grateful CONSERVATION.

In European countries it is the rule rather than the exception that the son learns and follows the trade of his father. In this country the methods of keen competition between many private business colleges assist materially in making the reverse condition true. These private institutions compete with the excellent commercial courses offered free in the high schools of many of our cities. So keen is this competition for students that the addresses of the boys and girls in the eighth grade are paid for in order that the representatives of these private commercial colleges may call upon the parents to bring pressure upon them to send their sons or daughters to these schools. Positions are promised to graduates. By this means many of our boys and girls receive a wrong impression of the true value of an artisan's life simply because a position which permits of white collar and cuffs and clean clothes is made to appeal to them. I look, if not with suspicion, at least with anxious curiosity upon any system of education whereby those who offer it make their livelihood from struggling parents, who already pay taxes in order to offer the same instruction free and in a better way to their children. It is evident that a thorough commercial course in connection with a four-year high-school schedule, with its thorough drill in literature and composition, will make such a graduate of more intrinsic value to the employer than a hasty, crowded course of a year or so in a business college. This does not imply that there are not some good private business colleges or that they do not have their place, but school boards

should know their methods of procedure and take steps to meet their competition by educating both parents and pupils to an appreciation of what a complete high-school commercial course offers.

The city which is fortunate enough to have a municipal trade school in its public-school system can hold before every boy, ere he reaches the age of fourteen, the incentive to remain in school and make the most of himself while he has the opportunity. This can be done by having properly organized and conducted inspection trips for all the boys under fourteen in the public and other schools of the city under the supervision of their respective principals to the trade-school classes while under working conditions. Before leaving the trade school they should be reminded that they must soon leave the school which has been their school home for eight years. Where are they going to? What do they plan to do? What would they like to become? Some have been thinking about the matter, some have never given it a thought. Since they must all make some choice in a few months it is vitally important that they be informed of the heritage which is theirs. They may go on to the high school and choose any of the courses offered there, one of them being a thorough commercial course; they may go on from the high school to the normal school and fit themselves for educational work; or to the university and prepare for a professional life; or they may take the preparatory course at the trade school and afterward the regular trade-school course and prepare for the life of a skilled artisan. They are reminded that it makes little difference what one chooses for his life-work providing he chooses the thing which he feels born to do and that something requires STUDY and TRAINING to reach its highest plane. All must work at something. They are also reminded that a very small percentage of the thousands whom they pass daily, going to and from work, are going to and from a work which they were born, or which they were especially trained, to do. If they prefer the life of an artisan, employers much prefer to hire the trade-school graduate than to try to train him in their shops. Their attention can be called, for instance—to use an illustration given in Milwaukee Trade School during such seventh- and eighth-grade inspection trips—to a modern gear-cutter, made of cast iron and steel and weighing about one ton. The bulk of raw material from which this machine was made was worth about fifty dollars. The machine cost the school one thousand and thirty-five dollars. The difference in price between fifty dollars for the raw material

and the one thousand and thirty-five dollars for the finished tool represented the work and skill required to change the crude stock into an efficient machine. The value of the skilled mechanic, the trained business man, the experienced educator, or the successful professional man over the untrained worker in any walk of life is the amount of self-effort exerted by the individual in trying to reach some goal or ideal. This illustration hits the desired mark, for they have just seen these ingenious workings of the costly tool. The raw material of this high-priced machine might have been melted into rough window weights and sold for but little more than the price of pig iron, or it could be worked into a valuable, useful tool. Do these boys wish to remain practically raw material by beginning as messenger boys and ending by becoming automatons who offer for sale the muscles of their arms and legs, or do they wish to make out of themselves skilled, efficient citizens?

For the boy of fourteen who has completed the eighth grade and who wishes to learn a trade there should be a preparatory department of the trade school where he could learn many things helpful to the skilled artisan while waiting until he can with profit to himself and the community begin upon his regular trade-school course.

The influence of the trade school should also reach out to help a certain class of boys who perhaps cannot for various reasons complete the eighth grade, but who, if saved from employments which will lead them nowhere, would make good artisans at some chosen trade. The best place for trade schools is in the public-school system, and its specific place in that system is where it can help directly and indirectly the boys and girls who feel the desire or need to go to work, and its influence should be available when that desire or need presents itself. Its opportunities should be flexible and not only teach a thorough apprenticeship but also assist in continuation work, and part time instruction if necessary. Its strategic position can be used as a power for vocational inspiration equal to, if not greater than, its opportunity for actual trade teaching.

VI. THE PART-TIME CO-OPERATIVE PLAN OF INDUSTRIAL EDUCATION

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The co-operative plan of industrial education is primarily an attempt to co-ordinate and correlate agencies already existing, at least potentially, in the factory and the school in order to make better workmen and better citizens from the young recruits to the industries. Because the co-operative plan can be undertaken with very little initial investment, maintained at a minimum cost, and adapted to a great variety of conditions, it is the form of industrial education most widely available for immediate realization. Some entertain doubts of the adequacy of the co-operative school in comparison with the independent trade school on the one hand and the manufacturer's apprenticeship school on the other. The co-operative school with shop practice under factory conditions is more practical than the independent school, dependent on its own shops, but the co-operative school runs the risk of having the shop-work subordinated to other interests not consistent with the greatest thoroughness and progress in learning the trade. The co-operative school with its schoolroom work carried on in an efficient school with established standards of its own in equipment, administration, and pedagogical efficiency has a great advantage over the manufacturer's apprenticeship school carried on wholly within the factory; but on the other hand, there is danger that the school work of the co-operative school may not be made to correlate closely with the factory work. The principal difficulty seems to be in securing the right kind of co-operation. It has been shown that the half-time co-operative schools under favorable conditions may become very efficient and possess many advantages over schools of other forms. The short-time co-operative school having less than half-time, usually four hours a week for school work, is less ambitious in its aims than the half-time school and serves a somewhat different purpose.

METHODS OF CO-OPERATION

In all industrial education there are several parties in interest: the manufacturer, the workmen, the pupils, and the public. For the purposes of our discussion the interest of the pupils may be considered as part of the interest of the public. In the public co-operative industrial school the three principal parties in interest may become active participants in the management of the school. It is in the harmonizing and fulfilling of the legitimate aspirations of these three parties in interest that the co-operative school encounters its greatest difficulties and achieves its greatest excellence.

The parties in interest have much in common, but each places greatest stress on some feature that beyond a certain point becomes antagonistic or prejudicial to the interests of the others. The manufacturer properly desires a supply of efficient workmen adequate for the legitimate demands of his industry. If, beyond that, he desires to provide a surplus of workmen in order to reduce wages or break a strike, he antagonizes other interests; if he is concerned merely in speed of production, being indifferent to the social welfare of the workmen; or if he is concerned merely with the immediate usefulness of the apprentice to the industry, being indifferent to his progress in his trade, the manufacturer fails to contribute his full share to the fulfilment of the common purpose; if the manufacturer pays the apprentice less than he earns, that is, if the article produced by the apprentice costs less than the same article produced in the regular factory routine, then the manufacturer is again not dealing equitably with the other interests concerned.

Thoughtful workmen desire to recruit their ranks by means properly safeguarded in order that the industry which gives them employment may prosper and pay them good wages and give employment to their children. If the workmen desire to restrict the supply of labor unduly, or attempt to monopolize the right to work at a particular trade, or resist the introduction of improved methods of management and work, they deprive the manufacturer and the public of their lawful interests.

The first concern of the public is that each person, whether engaged in the industries or elsewhere, shall perform his part in the social organism intelligently, efficiently, respectably, and happily. Ability to do well some kind of productive work is fundamental to social efficiency. It is therefore pre-eminently a matter of public concern to train young recruits for the industries and to insure for them a reasonably free and

fair entrance into the vocation in which they are to achieve self-support and make their contribution to the social welfare. The public interest is comprehensive and, rightly conceived, may include all that is legitimate in the claims of the manufacturer and the workmen. Public control of co-operative industrial schools is able to harmonize the interests of the manufacturer and of the workmen, while effectively securing what is so often sacrificed in the controversies between labor and capital—the welfare of the general public. In the management of such a school the manufacturer, the workmen, and the public should all be represented, but the degree of success of the administration will be largely determined by the extent to which they merge their interests into one control for both factory work and school work.

SHOPWORK

In order to show the relation of the shop work of the co-operative school to that of other schools it is convenient to classify the various forms according to the purposes they serve as: (*a*) cultural, (*b*) preliminary trade training, (*c*) trade training.

Undoubtedly the use of tools in making things by any boy or girl reacts through the sense perceptions on the whole mental fabric, much as Professor Seguin's system of sense-training reacted upon the mentality of the feeble-minded, stimulating and developing it. The one or two hours a week usually given to such work in the public schools might profitably be extended by school or home tasks to five or ten hours a week for purely cultural reasons. Some slight vocational ends are also served by this work, but as a rule it has no point of contact with real trade-training and should be classified as cultural. Another kind of shopwork introduces the pupil systematically to different machines, materials, and processes belonging to a particular trade or group of related trades, but does so in an experimental way only, not attempting to provide the methods, facility, and experience necessary for production on a commercial basis. As a rule pupils in this class of shopwork make only one article of a kind during their course. There is no commercial product or factory system. Such work must be regarded as preliminary trade-training, if indeed it justly escapes the characterization of dilettante, because incapable of being turned to practical account. Good schools of this class are of great value to pupils preparing for higher technical courses for engineers, superintendents, and

foremen, and may prepare for apprenticeship. They do not provide a point of contact for direct entrance to the industry. Shopwork that gives real trade training conforms closely enough to factory requirements to turn out at the end of the course a workman whom the manufacturer will readily employ as a young journeyman. Some schools maintaining shopwork of this character, however, attempt to provide only a part of the whole course required for complete mastery of the trade. This kind of shopwork produces a commercial product which pays for raw materials, usually provides wages for pupils, and may be made to pay overhead charges if properly managed.

TRADE TRAINING IN SCHOOL SHOPS

Many philanthropic trade schools and several public trade schools produce a commercial product in their own school shops. There are many difficulties involved in this undertaking that must be set over against the difficulties of the co-operative plan. In the minds of some the balance is largely in favor of the co-operative plan, whether we consider efficiency in trade-training or problems of administration. Schools that maintain their own shops are at a serious disadvantage, both in the purchasing of raw materials and in the marketing of products. They must establish and maintain their own standards of efficiency in workmanship, speed of production, and *esprit de corps*. Moreover, there is an important psychological effect upon the boy or girl on being brought into contact with the factory in full action: it appeals to the imagination; it is an adventure in an undiscovered country; it ministers to the insatiable desire of youth to know the world. There are apt to be many advantages in equipment provided by the manufacturer in the factory. Such equipment is presumably of the type best suited to economical production; at least it is such as enables the manufacturer to conduct his business successfully. The adaptation of machine tools to the tasks imposed constantly taxes the skill of the inventor and the judgment of the manufacturer as well, who would soon be outstripped by his competitors if he failed to send out-of-date machinery to the scrap heap. I cannot see how a school in which the machine tools were not required to show their adequacy in the cost sheets of production could ever grasp the problem of suitable equipment for the highest productive efficiency, or how a school in which the machine tools did not by a commercial product earn a suitable sum to be set aside for interest and depreciation

could afford to keep its equipment up to date by discarding types of machines and methods that were unprofitable for factory use. While the problem of equipment belongs primarily to the manufacturer, the workman's experience is indelibly impressed by it, and his whole attitude toward his work, as well as his competency as a workman, are materially affected. In the co-operative school the business acumen and experience of the manufacturer are actively enlisted in the management of the school and the completely organized purchasing, selling, and accounting facilities of the factory serve the school at the same rate as the factory.

Nevertheless, it must be admitted that to insure the management of shopwork so as to afford thorough instruction, steady advancement, and comprehensive practice in the various details of the trade are the gravest problems of the co-operative school. In this respect the independent trade school has its greatest advantage. It has been boldly claimed even that "modern industrial methods preclude the giving of such instruction in commercial shops." All must admit the danger that such instruction may be meager, haphazard, or too much interfered with by the exigencies of the factory.

FULL RESPONSIBILITY FOR SHOPWORK

To guard against the danger just discussed, co-operative schools should assume full responsibility for the character of the shopwork. The supposition that the manufacturer would not agree to such a plan is hasty and not well founded. He may be led to see that under a suitable plan in which he has a voice full responsibility by the school may be decidedly to his advantage. The Beverly Industrial School is a half-time co-operative school, having full responsibility and control of the shopwork done in the factory of the United Shoe Machinery Company. The Wisconsin Commission on Industrial Training says of the Beverly plan, "The remarkable point and the safe point, both from the standpoint of capital and labor, and also from the standpoint of true industrial education, is that the arrangement is controlled entirely by a a committee." The committee consists of five members of the school board, the mayor, and the assistant superintendent of the factory. The superintendent of schools is the secretary and executive officer of the committee and has general supervision of the school. The assistant superintendent of the factory is chairman of a subcommittee of three on instruction in the school. He co-operates with the superintendent

of schools and the director of the industrial school, and he attends to many of the details of management of the shopwork, but is subject in all these matters to the direction of the committee in charge of the industrial school. In no other way does the management of the factory exercise any authority over the school. The manufacturer's redress is to withdraw co-operation. The Commissioner of Labor in his report of the Beverly school calls attention to the fact "that should the company choose to withdraw its co-operation the school might be compelled to discontinue its work." This must be true of all co-operative schools, since co-operation is not compulsory; but there appears to be no good reason why the manufacturer should wish the school to discontinue its work so long as it is properly conducted.

The idea that such a school is a heavy financial burden to the manufacturer is erroneous. The apprenticeship schools maintained by the corporations are self-supporting, including the cost of theoretical instruction. In the co-operative school, with the theoretical instruction carried on at public expense, there is no sufficient cause why the shopwork may not be self-supporting.

The factory work at Beverly is arranged so that a group of twenty-five boys works in a separate department of the factory in charge of a school instructor as foreman. On the following week the same instructor teaches this group at the school, thus making possible the highest degree of co-ordination and correlation between the shopwork and the school work. The first two instructors of this kind (machinist-instructors in charge of pupils in factory on alternate weeks) in the Beverly school had the following qualifications: R. H. L., with Div. A, four years as apprentice with Fay & Scott, Dexter, Me.; two and one-half years in manufacturing and in tool departments of United Shoe Machinery Co.; three years as machinist in U.S. Navy; one-half year as machinist in U.S. Navy Yard at Brooklyn; graduate of Pratt Institute; six and one-half years as draftsman, and one and one-half years as assistant chief draftsman with the United Shoe Machinery Co.; three years as instructor in machine drawing in the Beverly evening school; one year as instructor in machine drawing in evening classes in Franklin Union, Boston; P. D. S. with Div. B, graduate of Richmond Academy, Augusta, Ga., and Rhode Island School of Design; four years an apprentice, one year instructor of apprentices with Brown & Sharpe Mfg. Co., Providence, R.I.; two months in charge of apprentices with Bullard

Machine Tool Works, Bridgeport, Conn.; three years in tool department, three years in drafting room with the United Shoe Machinery Co.

The boys in the Beverly school do not come under the instruction or supervision of the ordinary shop foreman, do not work beside the regular workmen, and do not share with the regular workmen the use of machine tools. The work to be performed is chosen with reference to the pupils' needs and usually consists of reserve orders for small quantities that need not be rushed.

PART RESPONSIBILITY FOR SHOPWORK

If on account of the boys being scattered through many shops or for other reasons full control of shopwork by the school is not feasible, the manufacturer should be made by agreement answerable to the school authorities for the treatment given the pupils in the factory. Co-ordinators should visit the boys at work frequently, not only to correlate the work but to see that the boy is making suitable progress in the trade and is not exploited selfishly by the manufacturer. The Fitchburg school assumes part responsibility for the shopwork, but there is a lack of definiteness in its requirements of the manufacturers. The director of the school says, "By weekly visits to the shops and inquiries of the boys in their school week, I keep in touch with their work. Should a boy feel he is not getting just what he should he is not at all slow in making the fact known. Then, by taking the matter up with the proprietors and foremen, we soon find out whether or not a change should be made."

NO RESPONSIBILITY FOR SHOPWORK

A few half-time schools and most of the short-time schools (usually four hours a week) assume no responsibility for the character of the shopwork, the wages of the pupil, or any other matters concerning his progress and general welfare outside of the classroom. It is very difficult for the manufacturer, unaided by the school, unless he organizes a regular apprenticeship course, to carry on the shopwork with a due consideration for all the interests represented in the young worker. Few ordinary shop foremen burdened with their regular duties have the time, skill, or inclination to give systematic instruction to apprentices; owing to the extreme specialization in the American factory system, only

one class of operations can be learned in one department; and after a foreman has "broken in" a new boy and made him self-directing and profitable, he is likely to hold him as long as possible. Often the boy himself, misled by larger wages, is content to remain too long on one kind of work. Lewis Institute is maintaining a half-time course without responsibility for shopwork. "The manufacturers have shown their interest in their apprentices by being willing to incur the inconvenience of changing from week to week the boys who are working on a job, besides paying their tuition of fifty dollars a year. It was contemplated that the boys would pay the tuition out of their earnings." A philanthropist is paying the tuition of pupils in this school at present. The Ranken School of Mechanical Trades has a similar co-operative course for "boys employed during the day. The employer pays the tuition fee of fifteen dollars a year." This is a short-time course of seven hours a week. The Cincinnati Continuation School has a typical short-time co-operative course four hours a week, without responsibility for shop work. The city provides "the necessary teachers and general equipment for a school of industrial instruction while the manufacturers pledged themselves to send a sufficient number of apprentices to justify the establishment of the school."

The radical differences in the three types of co-operation in shopwork are due not so much to local conditions as to different conceptions of the functions of the school. The full responsibility plan aims at social welfare through public control while serving adequately each subordinate interest. It is not deemed necessary that the pupils should be indentured, the manufacturer restrained from terminating his co-operation after reasonable notice, or the authority of the school instructors over shopwork restricted. This is the highest type of co-operation and should be approximated as closely as possible wherever half-time schools are established. Short-time schools are a palliative, but not a cure, for the lack of intelligent and technically trained workmen. They represent perhaps the minimum requirement which should be made compulsory for all persons under eighteen years of age engaged in the industries. The report of the Wisconsin Commission on Industrial Education aptly says: "Your commission believes in doing something where nothing has been done . . . . in meeting in some way, however meager, the immediate wants of the many. . . . . The continuation (short-time) school may be only a stop-gap, but it meets the broadest aim and it will at once reach the greatest number at the least cost."

UNIT GROUP CO-OPERATIVE SCHOOL

For highly specialized industries, such as boot- and shoe-making, a somewhat different type of co-operative school seems feasible though not yet established so far as I know. There are from sixty to eighty operations to be performed in manufacturing an ordinary shoe. The related processes may be grouped into units, such as cutting, lasting, stitching, finishing. An association of manufacturers in a particular industry of this sort could distribute among the different factories the maintenance of the required school units for teaching the whole trade. Pupils could be enrolled for each unit separately, as in the short agricultural courses, in the slack-time classes, and in evening classes in general, but with this difference, that the shopwork would be closely correlated with the school work. Each unit would represent a link in the chain which, completed, would embrace the whole practice of the industry. A pupil completing one unit would be ready to enter the industry as a worker in that one line; a pupil completing the several units would be master of the combined processes of the industry.

PUPIL'S WAGES IN CO-OPERATIVE SCHOOLS

An essential principle in the economical management of trade schools is the utilization of the product of the pupils' labor to pay for raw materials and "overhead" charges and to afford the pupil remuneration for his labor in proportion to his competency as a workman. It is desirable for many reasons that pupils should earn wages; youths from fourteen to eighteen years of age have a passion for earning money like adults; sometimes the money is necessary for their support; but most important of all, wages may be made a powerful incentive to good workmanship and speed of production. One of the great advantages of the co-operative school over the independent school is the greater ease with which pupils may be provided with an abundance of productive work. Paying pupils by the hour for both schoolroom and shopwork is the prevailing custom in co-operative and apprenticeship schools, but each pupil should be rewarded in proportion to his achievements as a workman. Paying the pupil for school work by taking half his shop earnings for that purpose is false pretenses, comparable with much advertised social-betterment schemes that distract attention from an unjust wage scale. Whatever objections may be justly urged against the piece price or task price for regular workmen, it certainly has great advantages for pupils in trade schools. The pay envelope is then to

the pupil a constant measure of his productive efficiency, both in the use of time and in the standards of workmanship. Thus the proper balance between speed and good workmanship is constantly and automatically impressed on him.

When the shopwork is carried on in a separate department of the factory, as at Beverly, the accounts should show clearly the net earnings of the shop. This is the amount that should be distributed to the pupils as wages. The equipment account is debited with the value of all machine tools and permanent equipment and is credited from time to time with interest and depreciation charged up on the operating account and with machines and equipment returned to the manufacturer. The operating account is debited with the cost of raw materials, salary of instructor while in charge of shopwork, salary of shop assistant, wages of pupils, and overhead charges, representing power, light, heat, rental of floor space, interest and depreciation on machinery, accident-liability insurance, and cost of accounting. The operating account is credited with the value of all the product passed by the inspector. The value of the school product is determined by the cost sheets of the same articles produced in the regular routine of the factory. In Beverly it was assumed at the start that one-half the piece price was the proper amount to pay the pupil. At first there was rather a large deficit, but the deficit grew steadily less, so that it became apparent that the enterprise would soon be self-supporting on the half-price basis. As pupils reach the third and fourth years of shopwork their wages should more and more nearly approximate those paid regular workmen. The instructor must control systematically the progress from one machine to another and must curb any tendencies of the pupil to desire to earn rather than learn. The shopwork, after it is once under way, can and ought to be self-supporting, but it should never be a source of profit to the manufacturer, as it seems to have been in apprenticeship schools in some cases. One week in the school followed by one week in the factory is the usual plan of alternation. The State Trade School at Bridgeport, Conn., has a half-time scheme with two-week periods instead of one-week. In the Fitchburg, Cincinnati, and Providence high schools the co-operative classes have the same vacations as the public schools, so far as classroom work is concerned, but work full time in the factory in the summer vacation. Also, each pupil on the school week spends Saturday forenoon with his mate in the factory in order to be prepared to take his

place in the factory for the following week. In Beverly the school work continues forty-eight to fifty weeks a year, the same as the factory work, but on the school week the pupils have Saturday free. The machinist-instructor goes to the factory on Saturday of the school week to prepare to take charge of the shopwork on the following week. Long periods of alternation destroy close correlation between school work and shopwork and are undesirable except for slack-time classes. An indispensable feature of a co-operative school is the keeping by the pupil of a fairly complete record of all his shopwork. This record should include amount and description of articles worked on, time spent, free-hand dimensional sketches of articles manufactured, machines and other tools used, and problems that had to be solved. These records should be summarized to show general scope of the shopwork and number of hours devoted to the different parts of the trade. At Beverly it is deemed best for the boys to use jigs and similar labor-saving devices employed in reproducing standard machine parts until they have gained confidence and judgment in the operation of the machine tools; then they are taught to manufacture tools and jigs and experimental parts of machines. By using jigs at the start, pupils can immediately earn a considerable wage and later the teaching of operations without jigs is much simpler because the pupil understands how to use the machine tools to best advantage.

GENERAL FEATURES OF CO-OPERATIVE SCHOOLS

The public in America is only very slowly coming to realize what European nations generally have recognized, that the education of youths leaving the elementary schools to work at the age of fourteen is insufficient. Many pupils leave before completing the sixth grade even. For those completing the elementary course, their education is inadequate in amount and kind to protect the employer from unintelligent workmen, the community from ignorance of the requirements of social welfare, or the state from an incompetent electorate.

We provide evening schools which are generally compulsory below the fourth grade, but voluntary in respect to attendance above that point. The half-time and short-time co-operative schools are the beginnings of provisions for education during some portion of the ordinary working hours. Among the half-time schools, Fitchburg, Freeport, Cincinnati, and Providence co-operative classes are departments of high schools.

Completion of the elementary course is required for admission and at least one year full-time in the high school is required before factory work can begin. Cincinnati requires two years. Therefore, these schools deal with a select group of pupils, at least sixteen years of age by the time factory work begins. Lewis Institute, a philanthropic school, charging tuition, has a co-operative half-time class. Pupils must be not less than sixteen years old to be eligible to attend. The Beverly half-time co-operative school receives boys fourteen years old that have completed the sixth grade in the public schools. None of the short-time co-operative schools at which attendance is voluntary receives pupils under sixteen years of age. In Cincinnati in September, 1911, attendance, four to eight hours a week, at a continuation school was made compulsory to sixteen years of age for employed youths over fourteen years of age if they left school before completing the elementary-school course. So far as I know, this is the only compulsory day continuation school now in operation in the United States. A report says, "These pupils are now being classified as to the vocation followed, and will receive expert industrial instruction on the completion of the classification."

SUBJECTS STUDIED

Although continuation schools were originally intended to continue the regular elementary-school subjects, they are now chiefly devoted to teaching the technical and theoretical subjects required in the trades practiced. The plan of devoting the co-operative school wholly to the acquisition of technical knowledge and trade efficiency was greatly encouraged by the example of the apprenticeship schools maintained by the large corporations, by the demands of manufacturers not maintaining their own schools, and by the desires of the pupils themselves who hoped to increase their wages by this study. The philanthropic trade schools have also for the most part limited themselves to satisfying the demands of the trade, and give no separate place on the program for the cultivation of personal, social, and civic obligations. A report of the machinists' continuation school at Cincinnati says, "The general culture work has been, perhaps, the most difficult to work out. The school authorities have felt that such work was absolutely essential, while the majority of the boys were inclined to the opinion that it was a waste of time. The problem that confronted the director was to give

the culture work in such a way that the practical value would be evident." Acquiescence in dropping the formal studies of the public schools has been more ready because many that left school to work were not book-minded. Retarded two or more years, they give up and go to work because the school tasks seem beyond their powers. Such pupils can be reached and benefited only by some new method of approach.

This suggests that a new application of the psychology of interest and motivation is required for our industrial schools. May not the love of creative work that enables youths to take so kindly to shop work serve to motivate the personal, social, and civic betterment subjects? May we not with profit change our requirements from memorizing books to right actions; from book civics to intelligent participation in civic life; from formal physiology to hygienic living; from economics to social service; from grammar and composition to shop records and business and social documents? We need less formality, but more concentration, effort, and self-control. Formal examination papers may give way to tests of correct action and correct attitude in the personal problems of daily living. May it not be possible, also, that the industrial school, affording the pupil abundant sense stimuli and experience in manipulating materials and machines in creative work, is a far more effective organism for promoting mental development, at least for certain types of mentality than the bookish courses of the ordinary schools? There are two great purposes in industrial education: first, to cultivate a finer industrial intelligence, a greater skill, and a higher productive efficiency as an industrial unit; second, to develop a finer social intelligence, a controlling moral purpose in action, and a consistent activity according to ability in civic affairs. Experience may prove what some of us already suspect, that these two purposes may be closely correlated. Making an honest living contains the elements of living an honest life. Industrial efficiency, functioning in the person, implies such fundamental virtues as diligence, responsibility, self-control, and co-operation. Industry and right relations with fellow-workmen are an excellent approach to right relations to the community and the state.

Finally, there is a culture resulting from doing and being more vital than the culture derived from books alone. Industrial education makes this vital culture possible in greater or less degree to a class of individuals for the most part hopelessly out of reach of the traditional streams of liberal education.

VII. THE CINCINNATI CONTINUATION SCHOOLS[1]

PLINY JOHNSTON
Woodward High School, Cincinnati, Ohio.

A certain sanitarium gave a test for insanity which it always claimed was absolutely conclusive. It was very simple. The patient was given a large dipper and was set to emptying a tub of water set under a hydrant with the water turned on. If the patient continued trying to empty the tub without turning the water off he was declared to be hopelessly insane. We, as schoolmen, are undertaking a similar task in our battle against ignorance, as long as we allow a stream of ignorant children to leave our schools, simply because they are fourteen years old.

The continuation school has not stopped the flow. That is a subject for more aggressive action than has yet been undertaken; yet it seems to me that this sort of school has done more to retard the outgoing current than any movement yet inaugurated.

We have in Cincinnati four types of continuation schools, each as well suited to the type of pupils for whom they were devised as we have been able to make them. We probably have made many mistakes—many more than we would have made had we been able to profit from the mistakes of someone else.

MACHINE-SHOP CONTINUATION SCHOOL

This school was at first a private venture. Two large manufacturers employed a teacher for their men, a teacher not alone of the immediate and necessary principles of their work, but one able to give them also the technical outlook of the skilled machinist.

The apprentice class was the only class considered, and a few hours per week were set apart for the boys who wished to take the instruction.

[1] The author of this paper reports that he wrote to the school superintendents of the larger cities concerning the maintenance of continuation schools but failed to receive any accounts of work being done elsewhere. See A. J. Jones, "The Continuation School in the United States," *Bulletin of the U.S. Bureau of Education*, 1907, No. 1 (distributed gratis) for a discussion of the general problem.—EDITOR.

Encouraged by the results, more manufacturers entered the scheme. They realized that the business of giving an education is such a responsible one that an expert who has made it his life-work should have it in charge. Consequently they consulted the Board of Education and the work was put in charge of the Superintendent of Schools in September, 1909.

The school runs forty-eight weeks a year, eight hours a day, four and a half days a week, besides two half-days which are spent by the teachers in visiting the boys in the shop, seeing the conditions under which they work, consulting with the foremen about the needs of the boys, and getting ideas and material for their guidance in teaching.

The attendance averages about two hundred per week and about twenty-two to a class. The boys are paid their usual wages for attendance by the employers and are docked when absent or late.

A weekly report is made by the school to the employers in time for their pay-rolls. Two teachers are employed, both experienced shopmen and expert teachers. The cost of the school is about $3,000 a year, or $15 per boy. Twenty-one shops co-operate with the school.

The students are classified as closely as possible into four groups, according to their year of apprenticeship. The more immature come the early part of the week, and the advanced students the latter part of the week. The course is four years long, corresponding to the term of apprenticeship.

Course of study.—The course of study is as follows:

First year: Shop arithmetic, spelling, reading, composition, reading blueprints, drawing, geographical relations of shop materials and civics.

Second year: Objective geometry, science, iron, its manufacture and founding, blue prints, mechanical and technical drawing, shop practice, shop conventionalities and necessities, civics, and the reading of the lives of the world's improvers.

Third year: Geometry and algebra, physics, shop practice, foreman's question box, drawing, civics, and economic history and literature.

Fourth year: Trigonometry and applied mathematics, shop chemistry, shop practice, visiting of industrial plants, and discussing observations, especially of economy and waste, culture, the man as a wage-earner and citizen, debates.

All the work done in school is conducted as class study, the school not being equipped with machinery. The night school held in the

near-by large high school affords an opportunity for the boys to get a training in machinery.

The older men in the shop, who at first scoffed at the education of the apprentices, later made an appeal for some consideration for them. Accordingly, a night school, especially for them, was organized in the same building and by the same teachers, and the men are now studying four nights a week in order that the boys might not displace them. The fifth night the foremen attend school, and all unconsciously apprentices, mechanics, and foremen have learned what successful schoolmen have had burned into their souls, that there is no such thing as standing still, that they must advance, and that advance can only be made by hard study. At the end of the four years, if the work has been satisfactorily done, the boy receives a diploma, which stands for four years of toil scrutinized by foremen as well as teachers.

PRINTERS' CONTINUATION SCHOOL

An extension of this school has been made in the Printers' Continuation School, opened September, 1911. This differs, of course, somewhat from the original continuation school in its course of study, but far more in the manner in which it was suggested. This time it came from the workmen, the Allied Printing Trades Council and the Ben Franklin Club. This school meets one day per week, 7:30—11:30 A.M. and from 1:00—5:00 P.M. The boys are paid for attendance by their employers and forty-two have taken advantage of the instruction.

CONTINUATION SCHOOL FOR YOUNG WOMEN

The necessity of a continuation school for men is not as great as the necessity of a continuation school for women. No one who has ever engaged in any philanthropic work for girls in our large cities wonders why girls go to the bad; the wonder rather is how any of them ever remain clean. It is said that the New York shopgirl meets only one pure-minded woman in her whole city life, and that is her Sunday-school teacher. Since the Sunday-school teacher seems to be no longer a factor in the shopgirl's life, there is absolutely no influence, except accidental, that works for her good. Our girls now have one interest which they themselves have not created. Two hundred girls are now enrolled in salesmanship classes, in study of applied art and design, and of textiles and fabrics. As a part of this work there are twenty classes

where courses of home economics (nursing, sewing, and cooking) are given to young housewives. I would say of this course that it is the only one in all our public schools that is actually given at the time when it is most appropriate. The attendance on these classes is five hundred.

COMPULSORY CONTINUATION SCHOOLS

Last and most important of all in matter of numbers and influence is the compulsory continuation school.

Boards of education in Ohio are given permission to establish continuation schools for youths from fourteen to sixteen years of age, who are employed, and, after having established such a school, are given the right to compel attendance. The time required of the youth must not exceed eight hours per week. The Cincinnati board decided on four hours a week.

These pupils are divided into sixth, seventh, and eighth grades. As they are with us but one-half day per week their work must be of such a character that it will completely monopolize their time while in school, and cover as nearly as possible the leisure time outside. The four hours are divided into six periods, with a short recess.

Work for girls.—On the manual side the girls sew in the sixth, cook in the seventh, and make hats in the eighth grade. The girls of the sixth and eighth grades are given a period per day in industrial art of such a nature, for instance, as shirtwaist designs to supplement their work in sewing and hat designs for millinery. The girls are encouraged to note the fit of their own dresses, to bring garments from home which need remodeling, to finish garments cut out in school, to be able to tell long-wool cloth from shoddy, and finally to cultivate a taste, not for expensive, showy clothes, but for quiet clothes of honest worth. It may seem a trivial matter to direct the clothing of our young girls, but when we are told plainly that young girls are willing to barter their character for fine clothes and new hats the work does not seem out of place.

The scholastic side is not neglected, yet we cannot hope to cover the whole ground in arithmetic, grammar, geography, and history. We teach only the bare essentials in arithmetic, and there is certainly no great opportunity for close application in any branch. The usual lists of books were sent to these schools and the books were distributed, and very often the principal has been detected hiding such necessary books as algebra and formal grammar.

Work for boys.—Our boys are not set at the usual first work of manual training, namely, benchwork (not a particularly engaging work), but are immediately put in charge of a machine, a wood-turning lathe. The wheels go round and boys of the wilful sort cease thinking of themselves, because their attention is compelled by the machine they handle. By introducing the most active element first, their interest is at once secured and is thereafter easily directed to the quieter fields of manual training, such as mechanical drawing and pattern-work.

In the academic work the same principle of elimination and careful selection is followed as stated above in connection with the boys' courses. Every principle in arithmetic and grammar is on trial for its life, and many of the hoary haired have been thrown into the wastebasket.

Parents interested.—More attention is paid to the parents here than in any other school. On many an afternoon they come in "to see my boy or girl at work," and on many an afternoon they listen to the orchestra, the drama enacted by the pupils, the interesting talks, etc., which are given between 4:00 and 5:00 P.M., and then they return home with their sons and daughters, feeling that the world is growing better and that life is more worth while. Our unruly boys and girls (and there are a few that kind treatment and interesting work are not able to curb) simulate good behavior, because if they do not behave in school, their employer will be informed and they will be dropped.

Pupils' interest in the work an important factor.—The age of fourteen to sixteen inclusive is recognized as the rapid development of interest in self and life. There is need for care at this age in respect to the social life, and the reason that the high school in some of its phases is a most bitter disappointment is because of the lack of this social life. At this age the question of what the children learn is not as important as what they get by association, inference, and intuition. These young folks are put at automatic work in the shops. Their employers have learned by long experience that young persons, at this age, do not think—at least not about the interests of their employer or the care of his machinery. Thus they are set to work at machines where the only evidence of brains is found in the inventor. Day after day they do the same thing, the same way, and watch the clock till escaping time comes. Fatigue toxin has poisoned their bodies and their minds. The relief from that toxin is sought in amusement, and the amusement at hand is not of the right sort. Our course of study seeks, first of all, to interest the pupils in their work; and second, to give them something to think about during the

week. The girls are sewing and drawing and watching hat styles in the windows and on people. The boys go to the public library and read up to be ready for the other fellow in debate.

The employers insisted that we should teach the essentials, and these, in their opinion, were arithmetic and spelling. But when we attempted to teach the good old standard studies in the same old way, we were met with sullen, unresponsive silence. The reason was not hard to find. The principal questioned a class, thirty boys in all, as to why they had stopped school at the end of the fifth grade. Four boys stopped because their parents actually needed them, and twenty-six stopped because they were tired of school. What would you think of the continuation school that had so little pliability as to teach these sullen boys the same way in which the hated school they had just escaped from had done? Need we give any other reason to show why the old-time methods will not do in the continuation school?

Girls and boys go to the bad between the ages of fourteen to sixteen. Of course it may occur after that period, but unrestrained, unbridled youth, at this period, lays the foundation for a life of bitterness. The ideal school would keep children from fourteen to sixteen in school all the time, but since we have not, as yet, ideal laws, we must not let them run unrestrained after fourteen. The employer is too busy, but between the supervisor of the continuation school and the employer there is much useful supervision bestowed upon the youth.

The continuation school for older persons is a comparatively simple problem. These men and women have their fairly fixed habits, and it is not so much the individual that must be taken into account, but his life-work. That is, his trade is his concern and ours too. But in the compulsory continuation school we have the young animal to deal with, and the choice of the young animal's trade. He is vagrant both in body and mind. I will give you a type—not the worst by any means, but a boy taken at random. Here is his record, as taken from the Labor Certificate Office:

K828, WHITTIER SCHOOL, 7TH GRADE, AGE 15

Oct.	17, 1910	Ohio Messenger Co.	$5.00
Nov.	12, 1910	Robt. Clark Errand Boy	5.00
Dec.	3, 1910	Cincinnati Hat Frame Co.	
Mar.	3, 1911	Victor Lamp Co.	4.50
Apr.	10, 1911	Wm. Newmark Co.	
May	15, 1911	Rubel Bros.	4.00
June	15, 1911	Krippendorf, Dittman Co.	

This boy is drifting and I am told the girls are no better. This problem confronts all cities, and after the youths are gathered together, another and more perplexing problem will present itself, as it has to us. These young animals are pining for excitement, interest, sensation, and change. Most of them belong to the class of automatic workers, a most dangerous class to handle. Three ways of teaching were before us: first, to teach as we had always done, trusting to the sense of accomplishment to cause zest for future work; but I believe that no one who has ever faced a continuation school would ever advocate this method; second, to furnish sensational pleasure, to amuse, delight, anything to take their minds off their work, in order to present an antidote for the accumulated fatigue poison—the suggestion of a sociological expert; third, to teach the essential subjects in the most interesting way, to delight the mind and the eye by proper entertainments, and teach somewhat along the line of their work.

We have chosen the third plan and we have not yet repented of it, possibly because we have not tried it long enough. We can make no boast, except that we have succeeded in bringing to the front one more very difficult line of school work.

VIII. VOCATIONAL GUIDANCE

MEYER BLOOMFIELD
Director of the Vocation Bureau of Boston

When the Civic Service House, a social settlement in the crowded North End of Boston, invited the late Professor Frank Parsons, in October, 1908, to undertake a work of personally advising with the young men and women who attended its clubs and classes it soon found an outside call for such service to a degree which taxed the strength of the adviser and the resources of the institution.

So thoroughly did Professor Parsons conceive and outline his work, so detailed and even scientific were his methods of consultation, that before very long there literally came to him a country-wide demand for information and personal help. He was spared only long enough to write his *Choosing a Vocation*, the first modern work on this subject.

After his death, one of Boston's leading merchants and a number of public-spirited men and women decided to organize the work of vocational advising on a scale adequate to the demands which kept increasing. Mrs. Pauline Agassiz Shaw, the founder of the Civic Service House, and the writer, who for ten years had been its director, co-operated in this effort. Later the writer secured a leave of absence from settlement duties in order to direct the development of the new Vocation Bureau.

On May 4, 1909, Mr. Edward A. Filene, as one of the moving spirits of the civic movement known as Boston 1915, received the following letter from the secretary of the Boston School Board:

> DEAR SIR: I respectfully call your attention to the following order which was passed by the School Committee at a meeting held yesterday evening.
>
> "Ordered, that the Boston-1915 Committee be requested to secure the co-operation of the Vocation Bureau for the purpose of assisting graduates of the public schools of this city in choosing wisely the most appropriate employment, etc."

On May 12, after a conference in the Boston-1915 office, the Executive Committee of the Vocation Bureau sent the following statement of its plan of co-operation to the School Board:

First, The Vocation Bureau will employ a Vocational Director to give practically his entire time to the organization of vocational counsel for the graduates of the Boston Public Schools during the ensuing year;

Second, The work of this Vocational Director shall be carried on in co-operation with the Boston School Committee or the Superintendent of Schools, as the committee shall see fit;

Third, It is the plan of the Bureau to have this Vocational Director organize a conference of the masters and teachers of the Boston High Schools through the School Committee or through the Superintendent of Schools, for the purpose of providing that members of the graduating classes will be met for vocational advice either by this Vocational Director or by the co-operating schoolmasters and teachers, all working along a general plan, to be adopted by this conference.

Fourth, This Vocational Director should, in co-operation with the Superintendent of Schools or any person whom he may appoint, arrange vocational trips and vocational lectures for the members of the graduating classes.

Fifth, The Bureau believes that schoolmasters and teachers should be definitely trained to give vocational counsel, and therefore that it is advisable for this Vocational Director, in co-operation with the Superintendent of Schools, to establish a series of conferences to which certain selected teachers and masters in the schools shall be invited on condition that they will agree in turn definitely to do vocational counseling with their own pupils.

On Monday, June 7, the Boston School Committee having adopted the vocational guidance plans submitted, instructed the superintendent to appoint a school committee of three masters and three sub-masters to meet regularly with the director of the Vocation Bureau. This committee has been holding weekly meetings at the office of the Bureau, and its report after a year of service deserves quoting. Among its more important statements and recommendations are the following:

The Committee on Vocational Direction respectfully presents the following as a report for the school year just closed. The past year has been a year of beginnings, the field of operation being large and the problems complicated. A brief survey of the work shows the following results:

A general interest in vocational direction has been aroused among the teachers of Boston, not only in the elementary but in the high schools.

A vocational counselor, or a committee of such counselors, has been appointed in every high school and in all but one of the elementary schools.

A vocational record card of every elementary-school graduate for this year has been made, to be forwarded to the high school in the fall.

Stimulating vocational lectures have been given to thirty of the graduating

classes of the elementary schools of Boston, including all the schools in the more congested parts of the city.

Much has been done by way of experiment by the members of this committee in the various departments of getting employment, counseling, and following up the pupils after leaving school.

The interest and loyal co-operation of many of the leading philanthropic societies of Boston have been secured, as well as that of many prominent in the business and professional life of the city and the state.

A good beginning has already been made in reviewing books suitable for vocational libraries in schools.

It was early decided that we should confine our efforts for the first year mainly to pupils of the highest elementary grade as the best point of contact. The problem of vocational aid and counsel in the high schools has not as yet been directly dealt with, yet much that is valuable has been accomplished in all our high schools on the initiative of the head-masters and selected teachers. It is safe to say that the quality and amount of vocational aid and direction has far exceeded any hitherto given in those schools. The committee, through open and private conferences, and correspondence with the head-masters, have kept in close touch with the situation in high schools, but they feel that for the present year it is best for the various types of high schools each to work out its own plan of vocational direction. The facts regarding their experience can properly be made the basis of a later report. A committee of three, appointed by the Head-masters' Association, stands ready to advise with this committee on all matters relating to high-school vocational interests. Once during the year the principals of the specialized high schools met in conference the vocational counselors of the city and have presented the aims and the curricula of the schools in such a way as to greatly enlighten those responsible for advising pupils just entering high schools.

The committee have held regular weekly meetings through the school year since September. At these meetings every phase of vocational aid has been discussed, together with its adaptability to our present educational system. Our aim has been to test the various conclusions before recommending them for adoption. This has taken time. Our most serious problem so far has been to adapt our plans to conditions as we find them, without increasing the teachers' work and without greatly increased expense. We have assumed that the movement was not a temporary "fad," but that it had a permanent value, and was therefore worthy the serious attention of educators.

Three aims have stood out above all others: first, to secure thoughtful consideration, on the part of parents, pupils, and teachers, of the importance of a life-career motive; second, to assist in every way possible in placing pupils in some remunerative work on leaving school; and third, to keep in touch with and help them thereafter, suggesting means of improvement and watching

the advancement of those who need such aid. The first aim has been in some measure achieved throughout the city. The other two have thus far been worked out only by the individual members of the committee. As a result we are very firmly of the opinion that until some central bureau of information for pupils regarding trade and mercantile opportunities is established, and some effective system of sympathetically following up pupils for a longer or a shorter period after leaving school is organized in our schools as centers, the effort to advise and direct merely will largely fail. Both will require added executive labor which will fall upon the teachers first. We believe they will accept the responsibility. If, as Dr. Eliot says, teachers will find those schools more interesting where the life-career motive is present, then the sooner that motive is discovered in the majority of pupils the more easily will the day's work be done and the product correspondingly improved.

In order to enlist the interest and co-operation of the teachers of Boston, three mass meetings—one in October and two in the early spring—were held. A fourth meeting with the head-masters of high schools was also held with the same object. As a most gratifying result the general attitude is most sympathetic and the enthusiasm marked. The vocation counselors in high and elementary schools form a working organization of over one hundred teachers, representing all the schools. A responsible official, or committee, in each school stands ready to advise pupils and parents at times when they most need advice and are asking for it. They suggest whatever helps may be available in further educational preparation. They are ready to fit themselves professionally to do this work more intelligently and discriminatingly, not only by meeting together for mutual counsel and exchange of experience but by study and expert preparation if need be.

As a beginning of our work with pupils we have followed out two lines: the lecture and the card record. The addresses have been mainly stimulating and inspirational. It seems to the committee, however, that specific information coming from those intimately connected with certain lines of labor should have a place also in this lecture phase of our work. In a large number of high and elementary schools addresses of this character have been given by experts during the year. The committee claim no credit for these, though carried out under the inspiration of the movement the committee represent. The custom of having such addresses given before Junior Alumni Associations, Parents' Associations, and evening school gatherings has become widespread, the various masters taking the initiative in such cases. The speakers are able to quote facts with an authority that is convincing to the pupil and leads him to take a more serious view of his future plans, especially if the address is followed up by similar talks from the class teacher, emphasizing the points of the speaker. This is a valuable feature and should be extended to include more

of the elementary grades, especially in the more densely settled portions of the city, from which most of our unskilled workers come.

A vocational record card, calling for elementary-school data on one side and for high-school data on the other, has been furnished all the elementary schools for registration of this year's graduates. The same card will be furnished to high schools this fall. These cards are to be sent forward by the elementary-school counselors to high schools in September, to be revised twice during the high-school course. The value of the card record is not so much in the registering of certain data as in the results of the process of getting these. The effect upon the mental attitude of pupil, teacher, and parent is excellent, and makes an admirable beginning in the plan of vocational direction.

The committee are now in a position where they must meet a demand of both pupils and teachers for vocational enlightenment. Pupils should have detailed information in the form of inexpensive handbooks regarding the various callings and how to get into them, wages, permanence of employment, chance of promotion, etc. Teachers must have a broader outlook upon industrial opportunities for boys and girls. Even those teachers who know their pupils will generally have little acquaintance with industrial conditions. The majority can advise fairly well how to prepare for a profession, while few can tell a boy how to get into a trade or what the opportunities therein are. In this respect our teachers will need to be more broadly informed regarding social, industrial, and economic problems. We have to face a more serious problem in a crowded American city than in a country where children are supposed to follow the father's trade.

In meeting the two most pressing needs, viz., the vocational enlightenment of teachers, parents, and pupils, and the training of vocational counselors, we shall continue to look for aid to the Vocation Bureau. The Bureau has been of much assistance during the past year, in fact indispensable, in matters of correspondence, securing information, getting out printed matter, and in giving the committee counsel based upon a superior knowledge of men and conditions in the business world.

The question of vocational direction is merely one phase of the greater question of vocational education. As a contributory influence we believe serious aggressive work in this line will lead to several definite results, aside from the direct benefit to the pupils. It will create a demand for better literature on the subject of vocations. It will help increase the demand for more and better trade schools. It will cause teachers to seek to broaden their knowledge of opportunities for mechanical and mercantile training. Lastly, it will tend to a more intelligent and generous treatment of employees by business houses, the personal welfare and prospects of the employee being taken into account as well as the interests of the house itself.

What has given rise to the nation-wide interest in the subject of vocational guidance? Advising with young people as to their future is not a new thing. The teacher has long been the child's counselor. Parents have always felt the deepest concern in this vital matter. What is the reason for a separate and specialized organization's undertaking a service so intimate and personal? Reflection must convince one that personal and individual effort, however invaluable, cannot deal adequately with modern conditions. Tenement homes, a large immigrant population as yet unacquainted with the possibilities of the new country, large school classes, and complex conditions of commerce and industry give rise to a situation which, besides friendly sentiment, needs facts, organization, and even science to understand and cope with.

We are living in the midst of a restless period, impatient with crudeness, and too preoccupied to pause over the stumblings and gropings of its bewildered youth. Into this arena of tense effort, the schools of our country send out their annual thousands. We somehow trust that the tide of opportunity may carry them to some vocational destination. Only the relatively few who reach the higher training institutions can be said to have their problems at least temporarily solved during the critical period of adolescence. A multitude are sent out to cope with the new conditions of self-support. Whose business is it to follow up the results of this transition from school to work? Whose business is it to audit our social accounts and discover how far our costly enterprises in education, the pain, the thought, the skill, and the sacrifice we put forth with the growing generation are well or ill invested in the field of occupation? The higher training schools are as profoundly concerned in this problem as are the elementary schools. The well-to-do are no less affected than the poor. Until society faces the question of the life careers of its youth, the present vocational anarchy will continue to beset the young work-seekers.

It is clear that we have slighted that part of a youth's life which marks the serious and critical transition from school to work, from the shelter of social care to the liberties and responsibilities of wage-earning. And we naturally expect therefore certain definite consequences of this neglect.

To some extent there is a reason for the meagerness of attention to this matter. Educational policies have not been so perfected as to afford those concerned with them the freedom and the leisure to regard much else, however pressing. Indeed it is fair to say that many a strong

word has come from the friends of school children who have been realizing the pitiful futility of spending all we do for our children with the certain prospect of nullifying for many whatever benefits have been gained during school life.

To the public as a whole, and not to any group of people, does the responsibility for making good the child's investment of its training lie. Vocational guidance presents itself as a community problem.

An important step in this direction was the organization in Boston of the Vocation Bureau, the first of the kind in the country. The men and women behind it, leaders in commerce, industry, education, and social service, appreciated keenly the present misdirection and waste in the critical transition from school to work. They saw that choice of a vocation is impossible to young people ignorant of the conditions of success and efficiency in the modern working world, and understood that neither school life nor working life could serve to best advantage unless training, information, and purpose were brought to those in need of them. Thousands of children leave school for work, not to follow a calling, but to get a job. Unguided, unprepared, and uninformed they find themselves in a condition of vocational anarchy. The social loss of all this, as discovered by reports, statistics, and observable consequences, is appalling. Our children are "pitch-forked into the working world," as Charles Booth has said. To lessen this social waste, to furnish necessary information about various occupations and their advantages and disadvantages and the training necessary for efficiency in them, to broaden the range of choice, and to deepen the "life-career motive" in education and in employment, the Vocation Bureau was organized. The main interest of the Bureau is not the employment of youth, however favorable and pleasurable the opportunity, but its best social investment. Underlying all its endeavors is the realization that a longer period in school and continued training are fundamental to achievement in every desirable occupation.

In accordance with this plan 117 teachers were appointed to serve as vocational counselors, and the opportunities open to boys and girls were fully discussed in a course of lectures and discussions conducted by the vocational director. Among the subjects presented were:

The Principles of Vocational Guidance.
The Shoe Industry.
The Boy and Girl in the Department Store.

The Sources and Methods of Vocational Guidance.
The Machine Industry.
A Group of Trades for Boys.
The Telephone Industry for Girls.
Stenography and Typewriting for Girls.
Bookbinding for Girls.
Architecture.
The Use of Statistics.

To supplement these discussions the Bureau has made a study of some forty or fifty Boston occupations, and a series of bulletins has been issued to the school counselors including among other titles:

The Machinist.
Banking.
The Baker.
Confectionery Manufacture.
The Architect.
The Landscape Architect.
The Grocer.
The Department Store.

This year's series of talks to school counselors will include:

For Boys:

The Machine Trades.
Agriculture.
Mechanical and Civil Engineering.
Electrical Engineering.
Textile Mill Working.
The Building Trades.
The Selling Clerk.

For Girls:

The Needle Trades.
Opportunities in the Department Store.
Conditions in Industry for the Young Girl Wage-Earner 14–16 Years Old.
Vocational Opportunities for the Girl Who Completes the High School.

The results of this work have been extremely important and the usefulness of vocational guidance has become definitely established. Fundamentally, vocational guidance aims to fit the boy and girl for their work and, what is equally important, to make their work fit for the boy and the girl. School life and working life are asked to co-operate in making the most of youth's possibilities. This is a service in behalf of efficient democracy; for work and school must join hands in fitting the future citizen for the highest and best achievements.

IX. INDUSTRIAL EDUCATION IN THE NORTHWEST

BEN W. JOHNSON
Supervisor of Industrial Education, Seattle, Wash.

The Northwest, particularly the state of Washington, is making some progress along the lines of industrial education and vocational training in the elementary and intermediate field of education. The meaning of the terms industrial education and vocational training is that used by Dr. David Snedden, commissioner of education of the state of Massachusetts.

The description of the schools established this fall in Seattle will further illustrate the writer's understanding of these much-abused terms.

The history of the movement here parallels that of a number of eastern states, notably Ohio. Manual training began its leavening influence in the school curriculum eighteen years ago in the Seattle High School. Since that time it has made itself an important department of the city's school system, requiring over fifty teachers for its instruction in all grades of the school. Tacoma and Spokane followed soon after Seattle, and have had a proportionate growth. Today there is scarcely any town over 4,000 which does not have some form of manual training in its school work, while many rural communities are making a beginning in elementary handwork and agriculture.

Like the best progress of the East the subject manual training has itself been greatly modified in method and content and an effort has been made to use the industries of the community as the basis of this work.

Such is the case in the great fruit-raising sections of the state. An example of this is at Wenatchee, where agriculture is being taught very successfully, with the emphasis upon horticulture and the present and future needs of that great fruit-growing country.

A similar example is that at Waterville. Led by a very able and public-spirited citizen, Hon. A. L. Rogers, the people are laying the foundation for what may be a very remarkable country school, in which

the boys from the entire countryside are to be taught such industrial branches as will fit them for the highest efficiency in practical farming.

At Snohomish the school board has recently acquired a considerable tract of land for practical agriculture. It also has iron- and wood-working shops in connection with this high school. The work in the latter, however, is based upon the educational rather than vocational point of view.

On the Pacific slope of this state, the region of the great fir and cedar forests, woodwork and the vocations dependent upon the production, manufacture, and distribution of this all-important product predominate. For the boy, at least, the forms of manual training using wood are fundamental. For the girl, the home-makers' arts everywhere universal and fundamental to womankind are the basis of her manual training. The vocational impulse, however, affects these subjects for the girl only so far as they equip her better for the actual work and responsibilities of the home.

The writer is not aware of any vocational or industrial education in this section that seeks to equip the girl better for earning a living in definite lines of women's work, other than those few, such as dress-making or millinery, that may be developed from her work in the home-making course of the regular school work.

The seeming lack of schools for vocational and industrial education is not so much due to any failure on the part of those responsible for the promotion of the educational plans in either state, county, or city districts but rather to a failure on the part of the people as a whole, who do not yet feel any serious need for vocational education. The reason for this is that the state is new and the development of the raw material of the state is but scarcely begun. Lumbering and fishing predominate in the western section while wheat-growing and fruit-raising predominate in the eastern section.

Manufacturing has scarcely begun with us, consequently the commercial pursuits predominate in the cities and towns. That we are destined to become a great manufacturing section is evidenced by the abundance of raw material available, and also from the marketable water-power available in the Cascade and Coast ranges of mountains.

Further evidence of this attitude was shown in the last session of the state legislature when a bill for the appointment of a state commission on industrial education was defeated, because the legislature was

averse to appropriating any money for this purpose and because it thought the state Department of Public Instruction able to carry on any investigation as to the industrial and vocational conditions, both in the schools and the industries of the state.

However, realizing that a beginning should be made and that there is no pressing demand for a trade school, Seattle, the largest city in the state, has this fall opened up three so-called industrial centers to accommodate the pupils of the intermediate period—the seventh and eighth grades and the first and second years of the high school.

Preliminary to carrying out this plan the usual manual-training course for the boys of the sixth, seventh, and eighth grades was the year previous enlarged in its aim, content, and method from the usual educational manual training of giving the boys sequential problems in construction, in the solution of which the boys would gain something of skill in tools and processes, some knowledge of the materials used, and some appreciation of the constructive life about them. This enlargement consisted in making an industrial or vocational approach to the manual arts—using them to illustrate as actually as possible the industries and vocations that are dependent upon these arts.

While the limitations imposed by the regular school program prevented very much change in the actual work done by the boys, it was possible to give it a larger significance as a study of those vocations using similar materials and processes.

For example, in the sixth grades the aim is to emphasize the four important facts the worker in wood has to know to be successful in his vocation: (1) his tools and how to use them; (2) what woods and materials are suitable to use and why; (3) how to form and put them together; (4) what is wanted and how to supply it.

In the seventh grade this approach emphasizes the same idea, but from another standpoint. Here the different kinds of workers in wood are brought out. The differentiation due to the service each renders society by reason of the special skill and knowledge he possesses is emphasized. The following four points are kept before the class: (1) a need to be supplied; (2) what materials are required; (3) what form or construction is best and necessary; (4) what tools, machines, and processes are required.

In this way the class considers and makes some problem illustrative of the furniture-maker, the ship-builder or carpenter, the bridge-builder,

etc. In the eighth grade the application of power in the service of these different vocations is taken up in a limited way in much the same manner.

No originality is claimed for this plan. It was suggested by similar efforts in other cities.

It is reasonably successful in the hands of a skilful and well-trained manual-training teacher. It is to be regretted we do not have more such teachers. The very limited time granted this subject in our schools (1¼ hours per week) is a serious obstacle in carrying out this idea successfully.

The industrial classes or centers opened this fall are best described by the circular which was sent home by the prospective pupil in order that his parents might understand fully the purpose of such a class:

SEATTLE PUBLIC SCHOOLS

THE ELEMENTARY INDUSTRIAL SCHOOL

The Board of School Directors of the Seattle public schools have authorized the opening of three industrial schoolrooms or centers.

The purpose of this circular is to explain the aims, plan, and program of such a school; the requirements for admission; its relation to the high school; and some of the reasons which have lead to its establishment.

The Elementary Industrial School is intended to provide a course of study relating much more to the industries than the ordinary school program, and containing a more practical training for a class of boys and girls in the public schools who will be better suited by instruction which will the better and sooner prepare them for training in a definite vocation. In every school there are some boys and girls who prefer studies and exercises that employ their hands and who have greater aptitude in such studies than their fellows. They advance in their development by what they do rather than by what they hear. They are practical-minded. Many such children drop out of school as soon as the law permits, not from lack of ability, but because the school fails to fit its procedure to their particular needs. The establishment of these industrial classes is an attempt to fit the school to the wants of this class of pupils. Such classes are not substitutes for a trade school, but are intended to lead more quickly and surely to apprenticeship in business or trade, while not closing the door to further study either in high or special schools if the pupil desires to pursue such a course.

The plan provides distinct courses for boys and for girls and requires the separation of those taking it from the regular school classes in the building where it is maintained, because of the difference between the courses.

The school day, which is the same as for the regular classes, will be divided

into seven periods of forty minutes each, about half of the time to be spent upon the ordinary school studies, modified to suit the end aimed at in this plan, and the other half to be devoted to the industrial and household arts—shopwork and mechanical drawing for the boys, and cookery, sewing, design, and drawing for the girls.

OUTLINE AND EXPLANATION OF INDUSTRIAL COURSES

For Boys	For girls
English	English
Geography—History	Geography—History
Arithmetic	Arithmetic
Mechanical drawing	Drawing and design
Shopwork	Sewing
	Cookery

English will include reading, spelling, penmanship, letter-writing, and composition.

Geography will include map studies, climatic conditions and influences, industries and products, exports and imports, routes and centers of trade, the studies to be correlated as far as practicable with the work in shop and kitchen.

In history there will be a review of the influential events in the development of our country, including particular reference to the country's greatest characters and their achievements, and of the causes contributing to our present national standing. The purpose will be to give an elementary knowledge of the important facts in our history and to imbue with a patriotic desire to be serviceable.

In arithmetic the fundamental operations include fractions applied in shopwork and in local problems; percentage and interest; applications of measurements and mensuration. The purpose will be to secure accuracy in the use of figures and practice in their application to practical affairs.

Industrial.—The shop instruction will consist of work intended to give knowledge of materials and their sources and use; tools and skill in their use; methods of construction; problems in machine- and hand-work; acquaintance with factory and individual production; the use of preservatives, as paints, oils, etc.; discussions of the various vocations; visits to work under construction, to manufacturing and commercial establishments.

The industrial work for girls will consist of:

Plain sewing, garment cutting and fitting, repairing, household linens, fabrics used in the home, sewing machine, class talks and discussions regarding clothing, hygiene, style, costs, methods of manufacture, the sweatshop, trades and vocations for women.

Plain cooking, properties of foods, economy, table service, sanitation, laundry work, care of the home, etc. Actual conditions are possible for

purchasing and preparing a simple lunch daily and serving same to other pupils at noon at cost. Class talks upon related topics of home life and its obligations, domestic service, income and expenditure, etc.

Applied design in surface decoration as affected by material and service, the use of color, problems in making designs for notebook covers, belts, pillows, draperies, etc. The aesthetics of the home.

THE RELATION OF THIS COURSE TO THE HIGH SCHOOL

The rank of this course will correspond to the seventh and eighth grades of the usual school course, and will require two years for its completion. At the end of the two years pupils completing this course, who choose to continue their school work, may enter the high school upon an equal footing with the pupils entered from the regular course.

REQUIREMENTS FOR ADMISSION

This course is open to any boy or girl thirteen years of age or over, who has completed the equivalent of the present sixth grade, provided, the parent or guardian makes a written request upon the form provided for that purpose, and further that the principal of the school last attended by the pupil recommends that the pupil should take the industrial course.

As only three schools can be established at this time, the number of pupils will have to be limited to 72 boys and 72 girls. Do you wish to have ——— attend one of these schools? If so, please sign your name below as indicative of your desire to have ——— chosen.

These classes or centers are similar to the prevocational classes of Indianapolis and the industrial school of Cleveland, Ohio. They differ in their organization and somewhat in the character of the pupil encouraged to enrol in these classes. Each class requires three teachers. The classroom teacher, a woman, has the boys while the girls are with the special teacher in cooking and sewing, and the girls when the boys are with the special teacher (a man) in benchwork and mechanical drawing. She is thus able to center the academic work about the respective instruction of both boys and girls. The plan uses the usual manual-training equipment of the building and the class occupies one of the regular schoolrooms.

In this respect there is no isolation or separation from the social spirit of the schools. Class distinctions are avoided. The significance of this plan of establishing such classes in any school building where conditions warrant it is illustrated by the following quotation from a letter to the writer written by Mr. W. E. Roberts, supervisor of manual training, of Cleveland, Ohio.

We have another Elementary Industrial School in operation, differing from the first in that it is a part of a regular elementary school. There are about one hundred and forty advanced sixth-, seventh- and eighth-grade children in this department. My earlier experiences made it possible to start this work without a hitch, and it has moved forward smoothly from the very beginning. I am more and more convinced that the very great problem stirred up by Industrial Education, so called, is not as much an industrial problem as a problem of remodeling our elementary-school work. The new movement is going to accomplish what should have been accomplished by the manual-training movement.

In the selection of the pupils the judgment of the principal and teachers was relied upon to recommend those boys and girls who would profit the most by such a course.

This has been done so that the pupils in these centers are of an average in capacity compared to any other group. These classes have been in operation about six weeks and sufficient time has not elapsed to determine any definite results. The expression of both pupils and teachers signifies that the purpose for which these classes were established is being met.

The aim of the course is industrial cultural education by the industries rather than education for the industries.

This last will undoubtedly come later when the age is reached that is best for learning a definite vocation. The success thus far assures us that the educational needs of a considerable number of pupils who grow by what they do, motor-minded, is for the first time being adequately met.

A word only can be said regarding the evening-school work. There is a large and enthusiastic attendance in the cities of Spokane, Tacoma, Everett, and Seattle, particularly in those classes in the commercial and industrial lines, such as bookkeeping, typewriting, mechanical and architectural drawing, machine shop, foundry, forging, and benchwork for the men, and dressmaking, sewing, millinery, household science for the women. As evidence of the interest and practicality of the courses, the total enrolment in Seattle night high schools this year is 2,163, with 35 per cent in the industrial courses.

The Y.M.C.A. in the three leading cities, Seattle, Tacoma, and Spokane, have more or less equipment for industrial education and are meeting a certain need among the workers in the various industries, such as the building and machine trades. This work is done at night. The

Seattle association has excellently equipped shops for the machine- and wood-working trades, and has been carrying on for the past two years a co-operative half-time apprentice course, in day classes. Sixteen boys from three machine shops are now enrolled in this course. They are also successfully given day instruction in gas-engine construction and operation, and there is also a class in surveying for vocational preparation for the subordinate positions.

All of this work is, of course, under private auspices and subject to the usual tuition of Y.M.C.A. work.

The foregoing statements as to what is actually being done in this Northwest in industrial education is at best incomplete. Sufficient has, however, been said to indicate that this section of the country is awake to the needs of this field of educational effort.

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